DOCUMENT RESUME

ED 094 282 CG 009 019

AUTHOR	Enderlein, Thomas E.
TITLE	Causal Relationships of Student Characteristics Related to Satisfaction in Post High School Employment.
INSTITUTION	Pennsylvania State Univ., University Park. Dept. of Vocational Education.
SPONS AGENCY	Pennsylvania State Dept. of Public Instruction, Harrisburg. Bureau of Vocational, Technical, and Continuing Education.
REPORT NO	VDS-Monog-20
PUB DATE	Jul 74
NOTE	176p.
EDRS PRICE	MF-$0.75 HC-$9.00 PLUS POSTAGE
DESCRIPTORS	Aspiration; *Employment; *High School Graduates; *Individual Characteristics; *Job Satisfaction; Models; *Predictive Measurement; Research Projects; Vocational Adjustment
IDENTIFIERS	*Minnesota Satisfaction Questionnaire

ABSTRACT

The purpose of this study was to develop a theoretical model for predicting employment satisfaction one year after graduation, using 9th-12th grade inschool variables of socioeconomic status, curriculum choice, and achievement. The independent variables used were chosen from the three psychological domains: cognitive, affective, and psychomotor. The criterion variable, job satisfaction, was measured by the Minnesota Satisfaction Questionnaire. The results of this study indicated that employment satisfaction was twice as predictable for the female sample as it was for the total sample, and it was not at all predictable for the male sample. Predictability in the female sample was attributed to several factors: (1) Entry level jobs are typically lower salaried with lower levels of responsibility and opportunities for advancement, and satisfaction with jobs of this type may be attributed to the fact that females tend to possess short range expectations of initial employment. (2) Women obtain employment in areas which are high in interpersonal social relationships, which implies that they may rank satisfaction received from the social environment above factors such as salary, responsibility, and prestige. (3) Women generally possess lower levels of occupational aspirations than do men. (Author/PC)

BEST COPY AVAILABLE

THE
PENNSYLVANIA
STATE
UNIVERSITY
DEPARTMENT
OF
VOCATIONAL
EDUCATION

ED 094282

CAUSAL RELATIONSHIPS OF STUDENT CHARACTERISTICS RELATED TO SATISFACTION IN POST HIGH SCHOOL EMPLOYMENT

THOMAS E. ENDERLEIN

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Pennsylvania Department of Education
Bureau of Vocational, Technical and Continuing Education
Research Coordinating Unit
(Project Number 19-3001)

VOCATIONAL — TECHNICAL EDUCATION **Research Report**

VOCATIONAL DEVELOPMENT STUDY SERIES

VDS MONOGRAPH, NUMBER 20

July 1974

PREFACE

This monograph is the twentieth report to be published as part of the longitudinal Vocational Development Study (VDS) series and the last publication for this project year. The VDS project was begun in the Fall of 1968 by the late Dr. Joseph T. Impellitteri and myself with the major purpose being the conduct of longitudinal research focused on the senior high school experience. The three main research thrusts for the project are: (1) the evaluation of vocational education programs; (2) the validation of vocational guidance instruments, and (3) the investigation of vocational development theories as they apply to today's youth. The project is designed as a ten-year longitudinal research effort which has as its beginning samples the entire ninth grade classes from Altoona (1968-69), Hazleton and Williamsport (1970-71), Pennsylvania. The VDS project is being conducted within the Department of Vocational Education at Penn State with the support of Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education.

Since the publication of the first VDS monograph in July of 1971 which detailed our plans for the entire ten-year effort, many studies have been conducted and reported which ranged from basic and theoretical to very applied type research. The study reported here by Enderlein is of a basic and theoretical nature and also represents, in my opinion, one of the major contributions which the VDS project has made to vocational education research over the years. This contribution, as I see it, stems from the application of Path Analysis to the evaluation of vocational programs using longitudinal data. In recent years vocational education researchers have suggested ways in which Multiple Regression Analysis (MRA) could be used in conducting program evaluation. Path

Analysis utilizes MRA in a more statistically sophisticated manner to gain the full benefit of longitudinal student and program data.

With this twentieth publication, the VDS project will undergo another change in leadership. Although I have been with the project from the start, it is only since the death of Joe Impellitteri, a little over two years ago, that I have assumed sole responsibility for the project. Beginning in the Fall, I will be leaving Penn State to assume a position at Lehigh University in Bethlehem, Pennsylvania as Associate Professor of Education working with their Career Education Program. Although I will continue my involvement with the project, Dr. Edwin L. Herr, Professor and Head, Department of Counselor Education at Penn State will assume the role of Project Director with the able assistance of Dr. Thomas E. Enderlein, the author of this and several other VDS publications, serving as project coordinator. Under Ed Herr's leadership there is every reason to expect the project to continue to fulfill its intended ten-year mission.

In stepping down as VDS Project Director, I feel strongly the need to pay tribute to all those who have worked with me on this effort over the past six years. Because there were so many people involved I can not possibly mention all of their names, but I will call your attention to the many different names which appear on the VDS monographs and indicate that behind each one the labor of many other individuals was involved. Those involved know who they are and how valuable their assistance has been.

Jerome T. Kapes, Assistant Professor
Graduate Studies and Research
Department of Vocational Education
VDS Project Director

TABLE OF CONTENTS

		Page No.
PREFACE		ii
LIST OF TABLES		vi
LIST OF FIGURES		vii
VDS CAPSULE		viii
Chapter		
I	ORIGIN AND IMPORTANCE OF THE STUDY	1
	Introduction	1
	Human Resources Development	3
	Role of Education	6
	Work Satisfaction	12
	Statement of the Problem	14
	Definition of Terms	17
II	REVIEW OF RELATED LITERATURE	20
	Introduction	20
	Studies and Publications Reflecting Selected Theories of Job Satisfaction	20
	Hoppock Study	21
	Vroom's Theory	24
	Herzberg's Theory	27
	Theory of Work Adjustment	31
	Studies and Publications Relating to the Variables Included in the Causal Model	36
	Sex	37
	General Aptitude Test Battery	38
	Occupational Values	43
	Socioeconomic Status	45
	Curriculum	47
	Grade Point Average (GPA)	49
	Vocational Maturity	51
	Occupational Satisfaction	55
	Literature Relating to Path Analysis	58
	Summary of Literature Review	62
III	PROCEDURE	66
	Population and Sample	66
	Follow-up Procedure	67
	Essential Data	74
	Sex	74
	GATB G and M	74
	Occupational Values	76

TABLE OF CONTENTS (Continued)

Chapter		Page No.
	Socioeconomic Status	78
	Curriculum	80
	Grade Point Average (GPA)	80
	Vocational Development Inventory (VDI)	81
	The Minnesota Satisfaction Questionnaire	82
	Analysis	83
IV	FINDINGS	93
	Introduction	93
	The Model	93
	The Efficiency of the Model For the Total Sample	95
	The Efficiency of the Model For the Male Sample	101
	The Efficiency of the Model For the Female Sample	105
	Summary	110
V	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	113
	Summary	113
	Introduction	113
	Statement of the Problem	116
	Procedures	117
	Findings	118
	Conclusions	120
	The Efficiency of the Model	120
	Curriculum	121
	Grade Point Average	121
	Vocational Development Inventory	123
	The Minnesota Satisfaction Questionnaire	124
	General Conclusions	128
	Recommendations	130
	For Further Research	130
	For Education	130
BIBLIOGRAPHY		134
APPENDIX A	Sample Questionnaire	145

LIST OF TABLES

Table		Page No.
1	Response to Altoona Follow-up Questionnaire for Class of 1972	71
2	Means and Standard Deviations for All Variables in The Model for Each of The Three Samples: Total Sample (Males and Females), Male Sample, and Female Sample . . .	94
3	Zero-order Correlations Among All Variables in The Model For The Total Sample, Males and Females (N = 208) .	97
4	Zero-order Correlations Among All Variables in The Model For The Male Sample (N = 89).	102
5	Zero-order Correlations Among All Variables in The Model For The Female Sample (N = 119)	106
6	$\overline{R}^2$ Coefficients for Each Endogenous Variable in The Model for Each of the Three Samples: Total Sample (Males and Females), Male Sample, and Female Sample . . .	111

LIST OF FIGURES

Figure		Page No.
1	The Model	16
2	Flow Diagram of Questionnaire Mailing Strategy.	69
3	Example Model	87
4	Path Coefficients And Residuals Of The Model For The Male and Female Sample (N = 208).	98
5	Path Coefficients And Residuals Of The Model For The Male Sample (N = 89).	103
6	Path Coefficients And Residuals Of The Model For The Female Sample (N = 119)	107

BEST COPY AVAILABLE

VDS CAPSULE

It is the intent of this section of the report to provide teachers, counselors, administrators, and all others concerned with the vocational development process with relatively brief and practical interpretations of the major findings and implications of this study.

Rationale for the Study

Society has frequently called upon its institutions of formal education to provide viable solutions to the many and varied problems concerned with this country's development of its human resources. The ability of an individual to work consistently, and to receive satisfaction from this work, is necessary if society is to meet the needs of its individual members and maximize its human resources. Work satisfaction must, therefore, become a concern of all educators. Since high school represents, for some, the last experience with formal education before entering into a lifetime of work, consideration must be given to in-school student characteristics and their relationship to employment satisfaction. It is with these variables that the school is able to deal and promote change related to the total growth potential of the individual and to the well-being of society.

Findings

There were four criterion variables in the model developed in this study which were evaluated using the total sample and the separate male and female samples. These four variables were: High School Curriculum (Vocational, Non-vocational), Achievement (Grade Point Average-11th

BEST COPY AVAILABLE

grade), Vocational Maturity (Vocational Development Inventory-12th grade), and Work Satisfaction (Minnesota Satisfaction Questionnaire-1 year after graduation from high school).

The first criterion variable to be considered in the model was Curriculum (Vocational-Non-vocational). The only student characteristic significantly related to Curriculum was the Sex variable, in the total sample. The Curriculum variable was not predictable by the combination of variables in the other two samples.

Achievement (GPA) was the next criterion variable to be analyzed and was found to be the most predictable of the four. Of the characteristics used in the model, General Aptitude Test Battery (GATB-G), Sex, Occupational Value "Salary," and Curriculum were related to GPA in the total sample. GPA was next best predicted by GATB-G and Occupational Value "Salary" in the female sample. GATB-G and Curriculum were significantly related to GPA in the male sample.

The third criterion variable to be analyzed was Vocational Maturity (VDI). GPA was significantly related to the VDI in the total sample and the female sample. Occupational Value-"Interest and Satisfaction," along with GPA, were related to the VDI in the male sample only.

Employment Satisfaction (MSQ) was the final criterion variable to be considered in the model. The variables: Occupational Values-"Interest and Satisfaction," and "Salary," and Vocational Maturity (VDI), (all variables from the affective domain), were significantly related to the MSQ in the total sample and the female sample. The MSQ was not predictable by the variables in the model for the male sample, but was predictable for females and the total sample.

BEST COPY AVAILABLE

In summary, employment satisfaction was twice as predictable for the female sample as it was for the total sample, and it was not at all predictable for the male sample.

Implications

1. The results of this study indicate that employment satisfaction for females was predictable to some extent while employment satisfaction for males was not predictable using the model. The variables which were useful in predicting satisfaction for females were all associated with the affective domain. This association, combined with the fact that satisfaction for males was not predictable, seems to indicate that males need additional attention to the development of those components of the affective domain which relate to satisfaction. Teachers, administrators and curriculum specialists must, therefore, include experiences within current and future courses of study which will provide all students the opportunity to develop their affective characteristics.

2. The findings of this study indicate that overall job satisfaction is related to variables which are associated with the affective domain. In this study these variables were: Occupational Values-"Interest and Satisfaction" and "Salary," and Vocational Maturity. These characteristics should receive additional attention by school personnel, especially those concerned with curriculum, and incorporated into courses available to students. It must be pointed out that affective domain development largely takes the form of identification and clarification of components of the domain rather than the transmission of skills and knowledges. It is felt that by placing additional

BEST COPY AVAILABLE

emphasis on the development of the affective domain the students will be provided with an opportunity for a more realistic view of the world of work in respect to themselves.

3. The findings of this study lend support to the concept of Career Education by drawing attention to the relationship between the affective domain and employment satisfaction. Career Education stresses the institution of work and the relationship between the school experience and the work environment. In addition, it attempts to provide individuals with exposure to the necessary components of work so that the work portion of the life of an individual may be as satisfying as possible. In addition to supplying this exposure, Career Education must continue to stress the total development of individuals. That is, it must provide opportunities for students to identify personal needs, values, and interests. Once these factors are identified and their relationship to the work environment understood, the individual should be better able to realistically relate to the work environment and become a more satisfied and contributing member of society.

4. Perhaps the overarching or global finding of this study is that female employment satisfaction was much more predictable than male employment satisfaction. The predictability of work satisfaction in the female sample may be attributed to the following:

a. For the most part, entry level jobs are associated with lower levels of responsibility, low salaries and little or no immediate opportunities for advancement. The expressed satisfaction by females with jobs of this type may be attributed to the fact that most females tend to possess short range expectations of initial employment. This is described by occupational

BEST COPY AVAILABLE

sociologists as the "until" phenomenon. The first job is usually transitional by nature and provides most females with a socially acceptable bridge between school and marriage. Those who do not marry eventually begin in their employment to seek job factors similar to those desired by their male peers.

b. In spite of the effort of the schools to provide all students with equal educational opportunities and to remove as much as possible sex biases in curricular offerings and instructional practice, it seems that the early experiences females have in both the home and school negate the attempt by the schools to provide equal cultural and educational experiences.

c. An analysis of the occupational areas which attract the majority of females indicates that women obtain employment in areas which are high in interpersonal social relationships. This implies that women may rank satisfaction received from the social environment above factors such as salary, responsibility and prestige. This greater emphasis on a rewarding social environment as one occupational preference for the typical female seemingly may compensate for factors which contribute toward job dissatisfaction in males.

d. Historically, females have not viewed employment with regard to long-range security and promotional possibilities. This failure to view employment from this perspective suggests that females possess lower levels of occupational aspirations than do males. It seems then that their satisfaction with entry level occupations may be attributable to these generally lower levels of aspiration.

I

ORIGIN AND IMPORTANCE OF THE STUDY

Introduction

The wealth of a nation is centered within the productivity of each citizen and in his or her contribution toward a better society. It follows, then, that this wealth is based upon a nation's ability to effectively educate and utilize its human resources.

Adam Smith, in his classical work, The Wealth of Nations, supports the above concept when he states:

> The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes, and which consist always either in the immediate produce of that labour, or in what is purchased with that produce from other nations . . . And also, which serves for the accumulation of stock, while nations continue to grow more wealthy. The difference between what is created and what is consumed is, therefore, the measure of the increase of wealth or stock . . . It follows from this that whatever the manner may be in which the produce of industry is consumed, whether in the affluent manner of living of productive labourers, or in the maintenance of unproductive people, the difference between the creative and consamptive power is the measure of the progress of wealth or property in every nation (Smith, reprinted in Playfair, 1811, p. 1).

Smith clarifies the above by stating that this proportion must be regulated in two ways:

> First, by the skill, dexterity, and judgment with which its labour is generally applied, and secondly, by the proportion between the number of those who are employed in useful labor, and that of those who are not so employed (Smith, reprinted in Playfair, 1811, p. 2).

From the above, it is evident that the rate of a nation's progress depends upon the extent to which its human resources are developed. As compared to natural resources, human resources may be described as the catalysts that transform an idea from an abstract concept into goods and

services. The term human resources, then, means man in his relationship to the consumer world. Therefore, human resource development is the people-oriented approach to the development of the nation's resources.

Distinct from manpower development, which focuses upon those human beings who are within the age limits when people traditionally are working or seeking employment, human resource development is a more inclusive term. It emphasizes present as well as future contributions to the output of goods and services for societial development. Human resource development includes every phase of education and training, in combination with the social-psychological faculties of individuals relative to their contribution to society.

The problems of human resources with relationship to the world of work generally fall into two categories: underemployment and underdevelopment.

Underemployment describes those individuals who possess a high degree of skill and knowledge in a specific area and yet are employed at a job beneath their qualifications. The result is that persons with specialized talent are employed in activities which do not fully utilize their skills.

The problems created by the underdevelopment of individual capabilities are of a different nature, and yet these problems and those attributed to underemployment, are interrelated.

A nation that is underdeveloped is usually described as one with many of its human resources underdeveloped. In this instance, a cycle develops that is not easily reversed. If its skilled manpower is used only to maintain benchmark goals, it is not free to work on the

aspiration goals of the country, and therefore is not adding the necessary expertise which moves a society toward a better standard of living. It is evident, then, that a human resource policy must be aimed at maximizing the development of its people's capacities.

Human resources underdevelopment is a problem for which solutions are available, within reasonable constraints, given financial resources and a national goal. Once this problem is resolved, the problem of underemployment becomes somewhat academic, in that workers are then being supplied at a rate capable of filling the demand.

Human Resources Development

Human resource development may also be described as the process by which all members of society are able to increase their skills, knowledges and capacities. More specifically, this process implies the accumulation of human capital and its investment in society, or the preparation of individuals for participation in society, or the preparation of individuals for fuller lives in that society.

Historically, the United States has pursued only two human resource policies. One is immigration and the second is public supported education. The first policy, immigration was used to regulate or adjust the manpower supply/demand ratio. This policy was possible at the turn of the century, because industry was not at the technological level it is today, and simply needed laborers to fill vacant positions. These employees were trained to fit the existing job and put to work.

After the job was finished, these persons were dismissed as quickly as they were hired. This procedure clearly resulted in a waste of human resources, not only in terms of these labourers' ability to create, but

also, because of their lack of education, in terms of their future ability to add to societial output. Human capabilities must be developed through education, while training should be reserved for specific tasks. The analogy is that a trained animal will perform its task, without regard to the overall scheme and how this task conceptually relates to the betterment of society, whereas education for human beings must contain the abstract concepts which will enable the individual to integrate concepts into a problem solving scheme when the need arises; regardless of the circumstances.

The development of human resources may be accomplished in a number of ways. Formal education is by far the most widely used vehicle for this purpose. It begins in kindergarten, continues through the elementary and secondary schooling, and into many programs of higher education, both two and four year programs. Apprenticeship programs and less formal systematic arrangements are a second way by which human resources may be developed. These programs include many of the adult programs which are limited to members of various organizations. A third way is self-development. Individuals take the initiative to develop their own capabilities and to acquire additional skills and knowledge. The level of the social structure of the society is usually directly related to the degree in which this motivation is present.

Human resources may be developed indirectly through improved public health programs and efficient medical delivery systems. Add to this a comprehensive program of improved nutrition, and the result is an increase in both the short-term output and the long-term output capacity of the individual. A cycle exists between improvements in health,

nutrition and education, and the standard of living, all of which may be causally inter-related or the result of a strong society.

Adam Smith (The Wealth of Nations, reprinted in Playfair, 1811) stresses the importance of formal education within the total human resource scheme by defining his concept of fixed capital as the skills, knowledges and capabilities of all members of society.

More recently, Theodore W. Shcultz (1961) in an address before the American Economics Association, restated this necessity for a nation to identify human resources as a form of fixed capital:

> The failure to treat human resources explicitly as a form of capital, as a produced means of production, as the product of investment, has fastened the retention of the classical nation of labor as a capacity to do manual work requiring little knowledge and skill, a capacity with which, according to this nation, laborers are endowed about equally. This nation was wrong in the classical period and it is potentially wrong now (p. 3).

This statement strengthens the concept that the economics of a nation must include the human resources variable, and treat this variable as a capital investment. It then seems reasonable to conclude that human resources determine, somewhat, the present state and futuristic trend of society. It is human resources which provide the motivation, creativity, skills and knowledge to achieve a society's standard of living. Thus the development of a nation's human resources is an antecedent variable to the economic growth of that nation.

The development of a nation's human resources, then, requires a unified national approach. This approach must be made with cognizance of the interrelationships among all variables of the economy. However, people must be permitted individual choice and differences in their quests for a fuller life, defined by themselves. This issue raises complex and interesting philosophical problems between the interests of

the individual and that of the state. Is it the individual who exists primarily for the state, or is it the state, the government, which is the servant of the people? An answer to this question is not possible because of the interdependency of the individual and the state.

A coming together of the objectives of the state and those of individuals must be achieved if a nation is to survive as a free society. The goals of a nation, generated by its citizens, must be the protection of the dignity, freedom and worth of the individual. Once accepting these goals, the individual has a responsibility in society to build upon and protect the society's standard of living and the basic freedoms of the individual.

The investment in human resources made by formal or informal education represents the leading edge of a nation's human resource development policy. To assure a realistic balance between the two philosophical issues previously stated, an investment in appropriate types of education is essential. A society which makes appropriate investments will progress and create a continuing process by which this balance is refined.

Role of Education

The skills, knowledges and capabilities of individuals can be developed in a number of ways. Formal education is perhaps the most common and effective method for this development. However, to be effective, all levels of the educational process must be utilized, from elementary to post-secondary.

It is no longer reasonable to assume that this educational process is available to all, regardless of ability, motivation, aspirations, and

family support. This system simply has not been accountable to those with special needs and therefore must change if it is to continue to properly serve the nation's citizens.

If a society is to grow, change is vital and necessary. In the past our schools have reacted weakly to change and as a consequence have demonstrated a limited capability to deal effectively with a changing society. The problems of the educational system are no longer limited to that system but are now of a national scope. Therefore, the nation as a whole should attend to the solution of these problems, and the educational system can act as the change agent in searching for these solutions.

The increase of public support for education, specifically federally supported vocational education, demonstrates this nation's commitment to the educational development of its citizens. The overriding rationale for this dominance is the concern of manpower planners for the waste of human resources in terms of skills and abilities. It seems that the underutilization of our human resources must be minimized if we are to realize a continued growth in our technological society.

The concern for this issue is not new. For reasons which have varied over time, vocational education has enjoyed federal support for its programs since 1862. This support was intended to stimulate and encourage its growth and development. The relationship between the federal government and vocational education was begun when President Lincoln signed the Morrill Land Grant Act in 1862. The Morrill Act donated public lands to states and territories for establishing colleges that would prepare people for leadership positions in agriculture and mechanical arts in the new industrial society.

The intent of the Morrill Land Grant Act was spelled out in section four of the act which stated:

> The endowment, support, and maintenance of at least one college where the leading object shall be without excluding other scientific and classical studies and including military tactics to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life (United States Statutes at Large, 1864, p. 502).

This intent was restated by Morrill in 1887 when he said:

> The design was to open the door to a liberal education for this large class at a cheaper cost from being close at hand and to tempt them by offering not only sound literary instruction, but something more applicable to the productive employments of live (Dunaway, 1946, p. 45).

It is clear that this act was this nation's first attempt to promote state supported education and training for employment. Up to this point, the emphasis has been upon more traditional subjects: letters, classics and science of a professional nature.

During the fifty-five year period from 1862 to 1917, the federal government handsomely supported these land-grant colleges for agriculture and the mechanic arts. However, no monies were appropriated for the training of persons at a level less than college grade. As the nation's economy began to rise, and the numbers of skilled workers from abroad began to decrease, it became evident to policy makers that appropriate measures were needed in order to deal with this manpower shortage. Efforts by the industrial and educational community resulted in the Smith-Hughes Act of 1917. This act provided the federal government's first major impetus for vocational education that was less than college grade. Since our constitution places the responsibility for education with the individual states, rationale for this involvement

ranged from the function of education in a free society to strengthening our national security by the development of human resources. In keeping with the spirit of the law, this act directed funds to the states, which in turn encouraged local programs and provided goals spelled out by their state plans, thereby, to some extent assuring local control. The vocational areas supported by the Smith-Hughes Act included agriculture, trades and industries, and home economics. The law required financial support on a matching basis from local, state and federal sources. The unique features of this law are its continuing appropriations and its minimum requirements for instruction and administration. This act provided not only the precedent, but also the model, for subsequent legislation. Of the acts that followed, those considered of major importance are briefly reviewed in the following paragraphs.

In 1936 the George-Dean Act was passed which provided additional funds for vocational education and provided funds for programs in distributive occupations. This act was amended by the George-Barden Act, which was signed into law in 1946 by President Truman. The George-Barden Act extended and broadened the provisions of the George-Deen Act and provided more flexibility in designating how funds should be used. There were no specific allocations made for such things as vocational guidance or teacher training. However, the decisions for these allocations were placed in the hands of each state board.

Further amendments to the George-Barden Act in 1956 responded to the needs of specific groups within the total manpower picture. One was the Health Amendments Act which authorized funds for the training of

practical nurses and other h health occupations. Another amendment to the George-Barden Act in 1956 au uthorized funds for vocational training for the fishery industries.

Another major commitmen nt of Federal support for education was made in 1958. Since the Morrill Act which responded to the need for education in agriculture and mech hanic arts may be considered the first commitment to education, the Na ational Defense Education Act in 1958, in response to the Russian laun nching of Sputnik and the resulting concern for the United States to cat tch up, may be considered the second.

Once again, the argumen nt for passage of this legislation was that it was in the interest of na ational security. The purpose of this act was to improve the quality o of elementary and secondary education programs. Two provisions of th his act which were considered important to vocational education are the e strengthening of the guidance program to improve occupational decisio ons, and support for preparing workers for highly skilled and technical l careers.

Four years later, the M Manpower Development and Training Act was passed as a Congressional re esponse to the high unemployment rate and the displacement of workers resulting from rapid technological advances in industry. This act not o only provides for identification, training and subsequent job placement t of unemployed or underemployed workers but also supplies a stipend to t trainees during the training period. The training these individuals r received as a result of this act will continue to be of value as the nation continues to focus its attention upon the education and trainning of skilled workers for its future labor force.

The next effort in this continuing process of education and training was on the educational front. If one were to consider the Smith-Hughes Act as the first major piece of legislation specifically for vocational education, then one could consider the Vocational Education Act of 1963 as the second. The development and passage of this act was influenced by the increased social consciences of the 1960's. This act centers upon people in need of vocational education, rather than upon occupational areas, as previous acts had done. This provision clearly demonstrated a philosophical shift in the objectives of vocational education, indicating a national concern for the development of human resources as a capital investment. Vocational education through the provisions of this act, was given responsibility for reclaiming those who were unsuccessful in the work world or those who were disadvantaged in some way. It appears that the issue against federal involvement in education was set aside with the passage of this and subsequent acts.

Following the report of the advisory council charged with reviewing the 1963 act, changes were recommended which resulted in the Vocational Education Amendments of 1968. Once again, a major philosophical shift in educational beliefs was being supported by Federal monies. Although the 1963 Vocational Educational Act broadened the previous definitions of vocational education, the 1968 Vocational Education Amendments completely eliminated any reference to fields of vocational education. It was the intent of these amendments to make vocational education available to anyone who might profit from it. In addition to making the 1963 Vocational Education Act more flexible, the 1968 amendments emphasized the need for programs for the disadvantaged and/or handicapped, and

established national and state advisory councils for program review. Thus, the philosophy was shifted in these amendments to respond to the needs of the people. No longer is it sufficient to provide citizens with preparation for work, but the opportunity to use that preparation is also needed.

Work Satisfaction

These considerations have clear-cut implications for educational policy thinking and curriculum decision making.

Schools, as the foundation of our society, are being called upon with increasing frequency to provide answers to the many and varied problems created by technological growth, especially those problems concerned with human resource development. Man, in his search for a fuller and more meaningful life, has recognized some of the complex forces which act upon his development in terms of his skills, knowledges, abilities and creativity.

In this society, the type of work usually determines the standard of living enjoyed by its members. One of the outcomes of the socio-educational process should be the merging of these complex forces to enhance the individual's ability to work consistently, and to receive satisfaction from this work. People tend to work for a variety of reasons: because there is work to be done, because work is enjoyable, or because of the need to earn a living. Whatever the reason to work, or whenever a person learns to accept responsibility and has the opportunity to become creative, work becomes a means to an end rather than an end.

It follows then that job satisfaction is an integral part of this complex interplay. Job satisfaction is a general attitude which is a composite of many specific attitudes in three areas: job factors, individual characteristics, and group relationships outside the job. It is with the second area of job satisfaction, individual characteristics or, specifically, in-school student characteristics, that this study is concerned.

Why seek in-school information about job satisfaction? As a first consideration, knowledge of these in-school factors is directly related to the offerings of vocational guidance, employment agencies and society as a whole. In addition, for the approximately 60 to 70 percent of the high school students who do not continue on to some form of higher education, high school is their last experience with a formal education situation before entering into a lifetime of work. It is for this larger group that the maximum utilization of potential must be realized for a fuller life. William C. Menninger of The Menninger Foundation charges schools with this same responsibility when he states:

> The success or failure of youth or man on the job, particularly as he chooses a new job, is determined in no small degree today by school counselors and by personnel workers in college, industries, public employment offices, rehabilitation centers, and social work agencies. All who serve in these capacities and in these settings hold awesome responsibility for assisting maturing youth and adults with their search for a satisfying adjustment to occupational life (Borow, 1964, p. xvii).

It can be seen, then, that schools must be concerned with the relationship between an individual and his satisfaction in the work world.

The identification of in-school factors and their effect upon job satisfaction is related to the total growth potential of the individual and to the well-being of society.

Statement of the Problem

This study is part of a continuing longitudinal effort in vocational development research initiated in 1968 by members of the faculty and staff of the Department of Vocational Education at The Pennsylvania State University under the title Vocational Development Study (VDS). The study is to be conducted at a unique point in time--unique in that the field of vocational education research is witnessing a merging of the needed longitudinal data and the sophisticated methodology required for the analyses of such time series data. Super (1969) identified Lattice Theory, Markov Chain Theory, and Path Analysis as possible useful methodologies in developing career models. This study will use the Path Analysis technique. For the first time, data are available which will provide information on the treatment effect of the educational program (grades 9 through 12) and its relationship to the graduate's employment satisfaction. This fact, plus the capabilities of path analysis to deal with longitudinal data, provides the opportunity to fully explore the implications of the relationships of these data.

Educational leaders such as Benjamin Bloom are calling upon researchers to utilize more sophisticated techniques than simple correlational analysis to provide answers to research questions. No longer will it suffice to concentrate on cross-sectional analyses where the emphasis is upon the determination of X_2 from X_1 within the context of correlational methodology. The utilization of time series data, where

available, and the investigation of the effect which independent variables have upon other variables over a period of time, seem to be a logical and appropriate response to this calling. Causal relationships and patterns must be explored in an attempt to answer complex research questions. Utilization of the Path Analysis Technique is relatively new to the field of vocational education research and affords users the unique opportunity to provide leadership in an exciting approach to educational research.

The general purpose of this study was to develop and evaluate a linear recursive path model using in-school student characteristics in relationship to the criterion variable, job satisfaction, as measured by The Minnesota Satisfaction Questionnaire. The model which was to be developed was based on longitudinal data, collected over five points in time: ninth, tenth, eleventh, and twelfth grades, and one year after graduation. The independent variables to be utilized in the model were chosen from the three psychological domains: cognitive, affective and psychomotor. In addition, measures of socio-economic status, curriculum choice and achievement were used. These variables were chosen on an a priori basis using theoretical considerations and the results of previously conducted pilot studies. Figure 1 indicates the model that was evaluated in an attempt to uncover paths, both direct and indirect, which relate job satisfaction to in-school student characteristics.

Specifically, the purpose of this study was to:

1. Develop a theoretical model for predicting employment satisfaction one year after graduation, using ninth to twelfth grade in-school variables based upon a review of previous research and pilot studies.

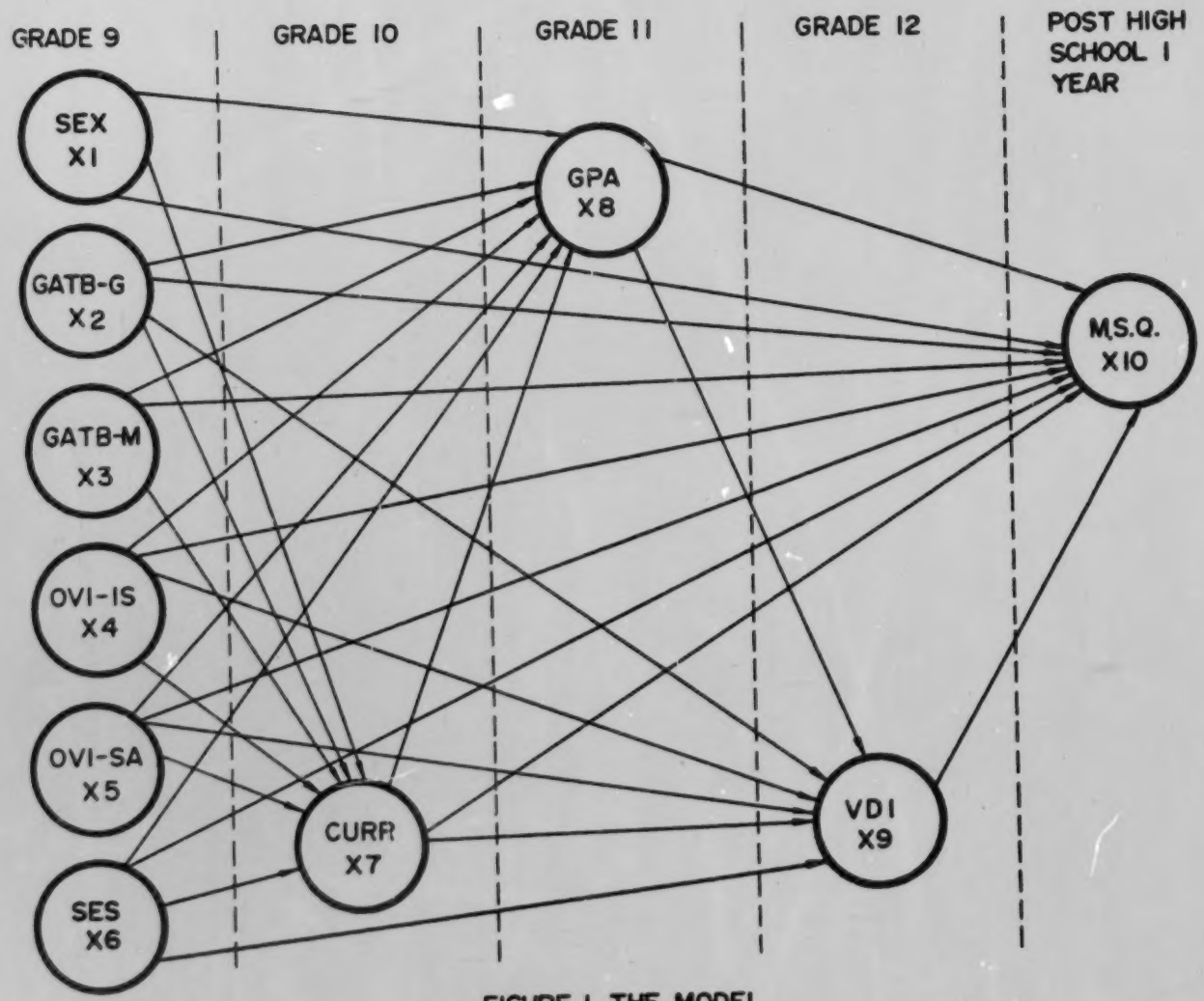

FIGURE 1. THE MODEL

2. Evaluate the validity and usefulness of the model, using a representative sample of both males and females.
3. Test the efficiency of the model in predicting job satisfaction for males only as compared to females only.

Definition of Terms

To promote understanding and clarity, the following terms are defined as they relate to this study.

Aptitudes: "Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty" (United States Department of Labor, 1965, p. 653).

Direct Effect: The amount of deviation in the dependent variable which is directly attributable to fluctuation in the independent variable.

Endogenous Variables: The variables to be explained by the theory under consideration (Blalock, 1968). Variables that have antecedent variables.

Exogenous Variables: "Variables which are assumed to be predetermined, the total variation of which is assumed to be caused by variables outside the set under consideration" (Land, 1971, p. 6).

Indirect Effect: The amount of variability in the dependent variable which is attributable to fluctuation in one independent variable causing fluctuation in a related independent variable (Land, 1971).

Intervening Variable: "A variable which tempers or modifies the effect of one variable on another" (O'Reilly, 1973, p. 14).

Job Satisfaction: "Represents the individual worker's appraisal of the extent to which the work environment fulfills his requirements" (Davis, et.al., 1968, p. 5).

Occupational Values: "A set of concepts which mediate between the person's affective orientation and classes of external objects offering similar satisfactions" (Zytowski, 1970, p. 176).

Residual Variables: "A variable assumed to be uncorrelated with the set of variables immediately determining the variable under consideration and to have a mean value of zero, is introduced to account for the variance of the endogenous variable not explained by measured variables" (Land, 1971, p. 6).

Standardized Path Coefficient: The mathematical value which "Measures the fraction of the standard deviation of the endogenous variable for which the designated variable is directly responsible in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all other variables (including the residual variables) are constant" (Land, 1971, p. 9).

Total Effect: "The concept of the total effect is merely an indication of the agregate effect of an exogenous variable on an endogenous variable through all possible direct and indirect paths" (Land, 1971, p. 17).

Total Indirect Effect: The sum of all the indirect effects of an exogenous variable, through all of the other exogenous variables, upon an endogenous variable (Land, 1971).

Vocational Maturity: "Refers to the maturity of an individual's vocational behavior as indicated by the similarity between his behavior and that of the oldest individuals in his vocational life stage" (Crites, 1961, p. 256).

II

REVIEW OF RELATED LITERATURE

Introduction

A review of literature related to this study was conducted in an attempt to isolate information which provided support for the rationale and procedure used in this study.

The following categories were selected for specific classification of this literature.

1. Studies and publications reflecting selected theories of job satisfaction.
2. Studies and publications relating to the variables included in the causal model.
3. Literature relating to Path Analysis.

The sources reviewed for this investigation included books, periodicals, journals, dissertations and unpublished materials. That literature which was found to be pertinent to more than one category was reviewed only once.

The review was limited to those areas outlined above and, although numerous studies and publications were reviewed, only those that met these criteria were included in this study.

Studies and Publications Reflecting Selected Theories of Job Satisfaction

Since vocational education has been charged with the responsibility of providing job training, it must be concerned with the development of adjustment competencies related to the work world. This process must be

present throughout the training program, if the individual is to approach his first job with some feeling of confidence that he will be able to adjust. If this process is accomplished, the individual is freed from a trial and error process of developing career objectives. An understanding of work adjustment is, therefore, essential for the educator preparing people for the work world. In an effort to assist those concerned with this problem, vocational psychologists conducted research studies in an attempt to predict and perhaps facilitate work adjustment. Various measures of job satisfaction resulted from these studies, and were reviewed.

Hoppock Study

After a review of the available literature concerning job satisfaction, Hoppock (1935) concluded that the data showed little agreement and were usually drawn from samples that were not a representative cross section of occupations. In an effort to obtain a more representative sample Hoppock conducted one of the first community-wide surveys on job satisfaction. The community of New Hope, Pennsylvania, was chosen for this survey. At that time, New Hope was a typical American manufacturing community, large enough to include a variety of occupations and yet small enough so that every residence could be contacted by an interviewer. The adults of the community were asked to indicate their attitude toward their present or more recent job by responding to a thirty-six item questionnaire.

The results of this survey indicated that 15 percent of those interviewed were dissatisfied with their jobs to some degree. This finding has been supported by data from studies conducted since the

original Hoppock study. In one of these reviews of job satisfaction, Robinson and Hoppock (1952) reported on 191 assorted studies reporting percentages of job dissatisfaction and found the median to be 18 percent of the work force dissatisfied. The stability of this low percentage based upon the large number of studies reviewed, contradicts the theory that workers are dissatisfied in their work because of the rapid technological advances of modern industry. In an attempt to obtain data on worker dissatisfaction from another source, Hoppock asked thirty-six personnel officers of national prominence to give their opinions of the percentage of workers they felt were dissatisfied. These opinions ranged from 0 to 80 percent with a mean of 49 percent. In considering this finding Hoppock pointed out that if numbers from 0 to 100 were drawn at random from a container, the average of the numbers drawn would be 50. Thus it is possible that the 49 percent may be no different from a chance occurrence.

From these studies it seems that the majority of workers are satisfied or at least neutral toward their present jobs.

Hoppock (1935) conducted a survey of people in one occupation. The teaching profession was chosen for this study. Five hundred teachers from 51 urban and suburban areas in the northeastern United States were asked to estimate or describe their job satisfaction on four attitude scales. A measure of job satisfaction was obtained by combining these scales. Of the total group the 100 most satisfied and the 100 least satisfied were given a questionnaire of 200 questions. According to the results of analysis of these questionnaire data, the satisfied teachers were different from the dissatisfied teachers in these respects.

1. The satisfied teachers showed fewer indications of emotional maladjustment than the dissatisfied teachers.
2. The satisfied were more religious.
3. The satisfied enjoyed better human relationships with superiors and associates.
4. The satisfied were teaching in cities of over 10,000 population.
5. The satisfied felt more successful.
6. Family influence and social status were more favorable among the satisfied.
7. The satisfied selected their vocations.
8. The dissatisfied complained of monotony and fatigue more frequently.
9. The satisfied were, on the average, 7.5 years older than the dissatisfied.

It was noted that the difference in average salaries did not differentiate between the two groups.

From information gained as a result of his job satisfaction study, Hoppock offers the following as major indications of job satisfaction:

1. The way the individual reacts to unpleasant situations.
2. The facility with which he adjusts to other persons.
3. His relative status in the social and economic group with which he identifies himself.
4. The nature of the work in relation to the abilities, interests, and preparation of the worker.
5. Security
6. Loyalty

These components represent a global measure of job satisfaction and do not attempt specifically to define this concept. Hoppock seems, however, to have isolated the factors which contribute the most to work adjustment. Job satisfaction is, therefore, an attitudinal relationship between the individual as an entity and the environment. It follows, that if an individual is unable to adjust emotionally, he is likely to experience difficulty in adjusting to a job and thereby experience job dissatisfaction.

Vroom's Theory

Vroom (1964) drawing on the work of Kurt Lewin, a social psychologist, has proposed a theory of human motivation within the work world. The concept of level of aspiration was first developed by Lewin and is related to the concepts of anxiety and hope (as aspects of) motivation. An operational definition of level of aspiration states that it is the level of future performance on a familiar task which an individual expects to reach. The level the individual says that he will achieve on the task is defined as the expectation, and success may then be defined in terms of whether this level is surpassed (Travers, 1967). The basic concept of valence applies to both Lewin's and Vroom's theory. Vroom (1964) defines valence as "the attractive orientation toward particular outcomes" or "the anticipated satisfaction from an outcome" (p. 15).

Vroom outlines two propositions for his theory:

> Proposition 1. The valence of an outcome to a person is a monotonically increasing function of the algebraic sum of the products of the valences for all other outcomes and his conceptions of its instrumentability for the attainment of these outcomes.

> Proposition 2. The force on a person to perform an act is a monotonically increasing function of the algebraic sum of the products of the valences of all outcomes and the strength of his experiences that the act will be followed by the attainment of these outcomes (Vroom, 1964, pp. 17-18).

Proposition 1 may be interpreted as meaning that an individual's desire for any objective is directly related to the likelihood that the objective will lead to future outcomes of given valence.

Proposition 2 states that the more attractive an outcome, the greater the likelihood the individual will act to achieve that outcome.

Vroom's model is often referred to as the Valence-Force theory. In this theory, job satisfaction reflects the valence of the job for the worker. The strength of this valence is related to the length of time a worker stays on the job. Therefore, turnover rate and absenteeism should be low for a group of workers who are satisfied. Research indicates that this negative relationship does in fact exist.

Weity and Nuckolas (1953) conducted a study to test the assumption that job satisfaction was negatively related to turnover. They mailed questionnaires containing measures of job satisfaction to 1200 insurance agents employed by a company in the south. Forty-seven percent of the 1200, or 564, of this group responded. Weity and Nuckols then related these data to information they received from the company about job termination. A correlation of .20, significant at the .01 alpha level, was calculated between the satisfaction scores and remaining on the job.

Sagi, Olmstead, and Atelsek (1955) asked 293 college students to complete a questionnaire designed to measure personal involvement with a group concerned with services for the student body. A follow-up survey was conducted six months later and showed 60 persons had voluntarily

withdrawn from the group. It was found that those who had high scores on the personal involvement measure maintained membership in the group while those who had low scores withdrew.

The relationship between job satisfaction and absences has long been of concern of persons concerned with human resources. The decisions that people make concerning whether or not to appear for work usually are made with concern for the real or imaginary consequences of the alternatives. If the consequences of working are more attractive than the consequences of not working, the worker can be expected to be on the job, and vice versa. The satisfaction a person receives from participating in his job represents the force acting upon the person to be present for work. Thus just being at work represents positive reinforcement for the individual.

One of the first investigations conducted concerning the relationship between job satisfaction and absence was by Korhnouser and Sharp (1932). They studied women factory workers and their rates of absenteeism. Although no data were given as to the magnitude of the relationship, they concluded that negative job attitudes were slightly correlated with absenteeism.

In a study conducted by Kerr, Koppelmeir, and Sullivan (1951) the measure of absenteeism was divided into total absenteeism and unexcused absenteeism since they felt that the type of measure would affect the size and direction of the relationship obtained with job satisfaction. They correlated the mean job satisfaction scores for each department of a metal fabrication factory with absence measures. They found that while job satisfaction correlated .51 with total absenteeism it correlated -.44 with unexcused absenteeism. The authors suggest that total

absence figures are influenced by long illnesses, thus the more satisfied workers are, the longer they remain on the job and the larger the number of absences they accumulate; these absences are usually explainable by a valid reason. Thus it is somewhat unclear what relationship exists between job satisfaction and absenteeism, and the most that can be said is that this relationship is moderate.

In the area of job satisfaction there exists the notion that a satisfied worker is a more productive worker. It is this assumption that is used as the basis by those who attempt to increase productivity by satisfying the needs of employees. Vroom's model is more difficult to apply in testing this relationship, since most workers are able to produce at a level that will avoid being removed from the job.

Katz, et.al., (1951), in a study conducted in a railroad company, found that those in the high production group experienced less intrinsic job satisfaction than did those in the low production group.

Brayfield and Crockett (1955), reporting a review of literature in the Psychological Bulletin on employee attitudes and performance, concluded that little evidence existed for any relationship between employee attitude and job performance.

This finding seems to indicate that there is no clear relationship between job satisfaction and job performance. This research also suggests that the conditions used to determine an individual's level of job satisfaction and job performance are not the same.

Herzberg's Theory

Herzberg, Mausner and Snyderman (1959), in attempting to determine causes of job satisfaction and dissatisfaction, were concerned with

examining indicators of the general question: what do people want from their jobs? Their original study was conducted with a sample of engineers and accountants, using the data collection technique of interviewing each individual in the sample. The basic item for which responses were sought was:

> Think of a time in the past when you felt especially good or bad about your job. It may have been on this job or any other. Can you think of such a high or low point in your feelings about your job? Please tell me about it. (Herzberg, et.al., 1959, p. 20).

The data collected from these interviews were content analyzed with respect to three categories; responses mentioned when a person was satisfied with his work, responses mentioned when a person was dissatisfied with his work, and differences between these two categories.

Herzberg (1959) concluded that the responses which were associated with satisfaction were different from those which were associated with dissatisfaction. The concepts of intrinsic and extrinsic work properties were used by Herzberg in this research. The results indicate that certain intrinsic work properties such as the work itself, responsibility, and recognition usually were associated with positive job attitudes. Conversely, items not associated with the job, such as company policy, administration, supervision, and wages, usually contributed to job dissatisfaction.

Herzberg, Mausner, and Snyderman classified work variables into two general classes; satisfiers and dissatisfiers. Those things which lead to job satisfaction were the satisfiers. These variables are usually intrinsic factors and operate as motivators for the individual. Those things which result in dissatisfaction were classified as the dissatisfiers. These variables are usually extrinsic to the job or hygiene

factors, since they are necessary to maintain the status quo but do little to improve satisfaction. It must be noted that both factors are necessary to meet the needs of the employee but it is the intrinsic or motivators that tend to increase job satisfaction.

Since the model classifies these general variables into a dichotomous arrangement rather than placing them along a continuum, the model has been named Herzberg's Two-Factor Theory. The premise for this model is that one class of variables have the ability to satisfy and not dissatisfy whereas the other class causes dissatisfaction and not satisfaction.

Herzberg s theory is not without controversy. The major criticisms of the model centers around the author's assumption that the interviewee reports accurately those conditions which contribute to both job satisfaction and dissatisfaction. It is felt by critics that people tend to relate the good things to results of personal accomplishments or intrinsic factors, in an attempt to satisfy self-esteem. On the other hand, when people are asked to relate dissatisfying aspects of the job, they are more apt to place the blame on factors extrinsic to the job, so as to maintain their own self-esteem.

Support for the Herzberg theory was reported by Schwartz, et.al., (1963) in a study of the male supervisors of public utility companies. They found intrinsic factors being mentioned more with satisfactory experiences and extrinsic factors being mentioned with experiences that created dissatisfaction.

Myers (1964) conducted a study reported in the Harvard Business Review, with a sample of employees from a manufacturing company, and

found support for the two factors of Herzberg's model. That is, intrinsic work properties were related to satisfaction and extrinsic work properties were related to dissatisfaction.

However, some studies supported Herzberg's theory. Wernimont (1966) conducted a study in which 50 accountants and 82 engineers responded to items to obtain self-description of job situations that were both satisfying and dissatisfying. The results indicated that both groups endorsed more intrinsic than extrinsic items. Achievement, responsibility, and the work itself were associated with satisfying experiences, whereas lack of advancement and recognition were mentioned when referring to dissatisfying situations. The author concluded that intrinsic and extrinsic properties of the job can be sources of both satisfaction and dissatisfaction, but intrinsic factors are stronger in both cases. Furthermore, variables that produce satisfaction are not undirectional as Herzberg indicated.

Ewen (1964) critized Herzberg's theory that satisfiers are associated with positive attitudes and dissatisfiers are associated with negative job attitudes. He cites the absence of validity and reliability measures for the data from the study, and the absence of an overall measure of job satisfaction. He concluded that the results cannot be generalized beyond the situation from which they were obtained. Further studies, in a wider range of occupations are needed.

Although Herzberg's theory has been critized by various researchers, he and his associates deserve credit for directing attention toward the attitudes of workers on job factors.

Theory of Work Adjustment

The Theory of Work Adjustment (Dawis, England, and Lofquist, 1964 and Dawis, Lofquist and Weiss, 1968) is a conceptual model developed in an attempt to describe, predict and facilitate work adjustment. The Theory of Work Adjustment is based on the premise of the correspondence between an individual and his environment, with the individual as a responding organism. This correspondence, in turn, is based on specific factors in the relationship: harmony, suitability of the individual, suitability of the environment, and the agreement and/or complementary aspects between the two within this relationship. In order for the individual to function, therefore, some degree of correspondence must be achieved between the environment and the individual. The Theory of Work Adjustment is based on the basic motives of human behavior that cause an individual to seek and maintain correspondence with his environment.

Work is only one of the environments to which an individual must relate, and all of these environments are interrelated. The individual relates to an environment with these skills. In turn, the environment rewards the individual. In work, the individual seeks to achieve correspondence between his skills and the rewards of the work environment. If this correspondence is not found in a work environment, the individual usually will leave to resolve this dissonance. However, both the individual and the work environment are constantly in a state of change. The process by which an individual seeks to maintain correspondence is called work adjustment. As an individual reaches maximum correspondence and this process stabilizes, tenure in the job usually results. Therefore, job tenure and work environment correspondence are directly

related in the positive direction. From this relationship it can be inferred that if a person has some degree of tenure on a particular job then he can be defined as being satisfied. Satisfaction is an internal indicator of the degree to which the environment of the job fulfills the individual's requirements. Satisfactoriness, an external indicator of this correspondence, indicates how well the individual meets the requirements of the work environment when viewed by sources other than the worker, usually the employer.

Satisfaction and satisfactoriness can be viewed as measures of the outcome of the work adjustment process. Individuals that fall within the normative established limits of satisfaction and satisfactoriness for which some degree of tenure can be predicted may be referred to as being in correspondence with the environment of the job.

The work personality of the individual is the significant aspect of the process of work adjustment. The major components of the work personality are the individual's set of abilities and needs. Abilities are the responses most frequently utilized by the individual. Needs are the reinforcers which occur most frequently when an individual responds to certain stimuli. The abilities and needs of an individual progress by a change process and crystallize whenever the individual's work personality stabilizes. At that time, no significant change occurs over repeated measurements of these needs and abilities.

The aspects of the work environment include the abilities for successful job performance and the reinforcement to the individual. This correspondence between the abilities of the individual and the ability

requirements of the job, as well as the correspondence between the need of the individual and the reinforcement system, determines work adjustment.

The following nine propositions of the theory of work adjustment, stated in operational terms, serve as a basis for research:

Proposition I. An individual's work adjustment at any point in time is indicated by his concurrent levels of satisfactoriness and satisfaction.

Proposition II. Satisfactoriness is a function of the correspondence between an individual's abilities and the ability requirements of the work environment, provided that the individual's needs correspond with the reinforcer system of the work environment.

Corollary IIa. Knowledge of an individual's abilities and of his satisfactoriness permits the determination of the effective ability requirements of the work environment.

Corollary IIb. Knowledge of the ability requirements of the work environment and of an individual's satisfactoriness permits the inference of an individual's abilities.

Proposition III. Satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's needs, provided that the individual's abilities correspond with the ability requirements of the work environment.

Corollary IIIa. Knowledge of an individual's needs and of his satisfaction permits the determination of the effective reinforcer system of the work environment for the individual.

Corollary IIIb. Knowledge of the reinforcer system of the work environment and of an individual's satisfaction permits the inference of an individual's needs.

Proposition IV. Satisfaction moderates the functional relationship between satisfactoriness and ability-requirement correspondence.

Proposition V. Satisfactoriness moderates the functional relationship between satisfaction and need-reinforcer correspondence.

Proposition VI. The probability of an individual being forced out of the work environment is inversely related to his satisfactoriness.

Proposition VII. The probability of an individual voluntarily leaving the work environment is inversely related to his satisfaction.

Combining Propositions VI and VII, we have:

Proposition VII. Tenure is a joint function of satisfactoriness and satisfaction.

Given Propositions II, III, and VII, this corollary follows:

Corollary VIIIa. Tenure is a function of ability-requirement and need-reinforcer correspondence.

Proposition IX. Work personality-work environment correspondence increases as a function of tenure. (Davis, et.al., 1968, p. 9-11).

In summary, the Theory of Work Adjustment is concerned with the way an individual progresses through the work adjustment process. This process is operationalized by the interrelationship between the individual's work personality and the work environment. The work personality consists of aspects of the interaction between the individual's abilities and needs, while the work environment consists of the ability requirements and the system of reinforcement. The results of the work personality/environment interaction are satisfaction, satisfactoriness and tenure.

Instruments were developed to measure the concepts of the theory and thereby aid in its implementation. Degree of work adjustment, satisfaction and satisfactoriness are measured by the Minnesota Satisfaction Questionnaire (MSQ) and the Minnesota Satisfactoriness Scales (MSS). Measurement of vocational needs and reinforcer systems is performed by the Minnesota Importance Questionnaire (MIQ).

The measurement of vocational abilities and ability requirements did not require the development of any new instruments since the General

Aptitude Test Battery (GATB) and Occupational Aptitude Patterns (OAPs) developed by the United States Training and Employment Service were available for research use.

The Theory of Work Adjustment was thus made operational and available for application with the development of these instruments. Lofquist, et.al., (1972) report an application of The Theory of Work Adjustment to vocational counseling. With the impetus provided by the University of Minnesota's Department of Civil Service Personnel, a Vocational Assissment Clinic was formed. The objectives of this clinic were to provide vocational planning and counseling services to Civil Service employees at the university. A feasibility study was conducted in an attempt to determine what services should be provided in the area of vocational development. The sample consisted of ten employees selected because they had not graduated from high school and had expressed desires for vocational self-improvement. Vocational assessment, counseling and planning were provided by the staff of the Work Adjustment Project. The various departments of the university would provide special services such as reading and study skills.

The Work Adjustment Project divided their input to the clinic into five phases.

Phase I: On-the-job contact - explaining the program to the employee.

Phase II: Pre-assessment counseling - explaining vocational goals.

Phase III: Vocational assessment - administering psychmetric instruments.

Phase IV: Planning - making plans for learning program.

Phase VI. Individualized learning program - providing employee with experiences designed for achievement of vocational objectives (Lofquist, et.al., 1972).

At the conclusion of the program, an informal evaluation was conducted to determine if the vocational objectives were met. The sample consisted of ten persons, ranging in age from 22 to 48 years, who had achieved 6 to 11 years of education in primary and secondary schools. Two were interested in improving their reading and spelling skills, whereas the remaining eight set the high school graduate equivalency, through the GED examination, as their goal. One of these eight passed all of the GED examinations, while one passed three tests, and one passed one test. Four of the original eight dropped out of the program. One employee with a beginning reading level assessed at less than 3.5 years had progressed well in the program.

This is evidence that the Theory of Work Adjustment is a useful model in developing services for vocational counseling, and that the instruments developed for the theory are useful tools for this service.

Studies and Publications Relating to the Variables Included in the Causal Model

The variables included in the model for this study were sex, General Aptitude Test Battery (GATB) scores, occupational values, socio-economic status (SES), curriculum, grade point average (GPA), vocational maturity and occupational satisfaction. Literature which supports the use of these variables in various combinations for research studies is available; however, no literature was found that utilized the Path Analysis Technique for examining the longitudinal relationships between

these variables and job satisfaction. Therefore, the studies reviewed reflect the general contribution of each variable as was relevant to its utilization in the model. The occupational values and GATB scores were grouped for this review, since the total sub-parts were not used. Thus, the review reflects the general heading rather than each specific value or score.

Sex. The sex variable was included to determine whether males would differ from females in terms of their job satisfaction. Hulin and Smith (1964) explored this question in a study measuring five different aspects of job satisfaction from a group of 295 male and female workers in four different plants. The analysis of the data indicated that female workers were less satisfied than the males with their work in three plants, and that there was no difference in the remaining plant. Further analysis of the data indicated that for the aspects of job satisfaction measured the ordering was somewhat consistent across the four samples.

In a study conducted by Breton and McDonald (1967), concerning career decisions made by Canadian youth, it was determined that males were more likely to have formed career intentions before entering a high school course of study than were females. Davis, Hagan, and Strouf (1962), in exploring the occupational choices of twelve year olds, found that female choices were positively correlated with more mature choices.

Jury and others (1971) conducted a study to determine the effect of demographic variables, including sex, on job satisfaction. The responses to 28 satisfaction scales from 1139 male and female employees

from six companies were factor analyzed. Sex analyses was carried for two companies only since only these two organizations had a large enough number of females to warrant investigation.

The analysis indicated that both the males and females expressed similar feelings about the progress of their careers, advancement opportunities and use made of their skills and abilities. One major difference was observed. The females differentiated on the organizational contexts and the superior-subordinate interactions more than did males. The males failed to categorize these into two separate factors but perceived them as one. A possible explanation given was that the females included in the sample were at the lower level of the management ladder. They were more conscious of this superior-subordinate relationship and separated this relationship from company policy.

An analysis of a different sample group was used for comparison. The dichotomy of the key-management group/non-key-management group, which is considered a more appropriate division of the management hierarchy, was used for this sample grouping. It was found that the higher level key-management group made the same distinction between superior-subordinate and company policy as did the females, whereas the non-key-management group created a more general factor with elements from both. Since this analysis is dissimilar from the original female explanation, it seems that sex differences in terms of job satisfaction might exist.

General Aptitude Test Battery. The General Aptitude Test Battery (GATB) was chosen to be used on the basis of previous studies

(Impellitteri and Kapes, 1969; and Kapes, 1971), because it measures manipulative as well as cognitive aptitudes. These studies indicated the GATB to be related to vocational students' course grades.

The General Aptitude Test Battery is probably the most researched aptitude test battery in existence today largely because of the ccoperation between the United States Department of Labor and the individual state Employment Services. This research is reported in the GATB development manual and is divided irto the areas of predicting success in the world of work (on the job), predicting academic achievement, and predicting success in training situations. An additional bibliography of past work in all three areas can be found in the General Aptitude Test Battery, Section III: Development, United States Department of Labor, October, 1967.

The following is a review of selected references which either directly or indirectly pertain to the GATB.

Super (1956), in an article discussing Multifactor Tests, cites the GATB as the most factor pure test and the one most useful in vocational counseling of all other multifactor tests including the Differential Aptitude Test (DAT).

Dvorak (1956) describes the GATB in terms of norms, administration and scoring, reliability, validity and the development of the OAP's. In addition, in the article mentioned above, Super praises the GATB, while, at the same time, pointing out the necessity for further information which has since been supplied by the GATB developers.

Some six years later, Super and Crites (1962, p. 330) state:

> The first edition of this text was both enthusiastic about the promise of this battery and critical of the paucity of data made available in the manuals and in other publications to justify the battery's proposed use. In two revisions of the manuals and in a

> large number of journal articles, Dvorak and her collaborators have since provided the empirical evidence needed for the evaluation and use of the test battery; in their current form they are a model of completeness and of clarity.

Culhane (1964) describes the release of the GATB and its subsequent use in schools. At the time this article was written, the GATB had been released to 600 schools in 36 states. Culhane suggests that the GATB be used in the junior high school in the areas of occupational exploration and curriculum choice. She claims that, in the interest of research and counseling, the GATB should be controlled by the United States Employment Services (USES) in cooperation with the schools, employing an interchange of data.

In the area of predicting success, Droege (1965) reports a study exploring the use of test norms developed on an adult sample to predict success of vocational-technical school students enrolled in the printing curriculum. This study reported a multiple correlation between the four aptitude scores; Intelligence (G), Verbal (V), Clerical Perception (Q), and Manual Dexterity (M). Further, it related these factors to the dichotomous criterion, the instructor's rating of good or poor, and found a multiple correlation equal to .38 and significant to the .01 alpha level.

A longitudinal maturation study on the GATB was conducted by Droege (1966) with students in the ninth, tenth, eleventh, and twelfth grades. Correlations between the twelfth grade scores with the scores of the other grades were as follows: 9th = .69, 10th = .72, 11th = .75. This study also indicated that the stability for scores was greatest for the shorter time intervals from twelfth grade and that little difference existed between boys and girls on stability measures. It was also determined that the scores were stable enough at ninth grade to be useful.

Ingersoll and Peters (1966) investigated the use of the GATB in predicting grade point averages in both academic and vocational curriculums in the Ohio secondary schools. Multiple regression analysis, used with a sample of 4,000 ninth and tenth grade students showed that aptitude (G) intelligence correlated most highly (.60) with the criterion for the total sample. Many academic areas were studied. The only non-academic areas studied were industrial arts and home economics at the ninth grade level; industrial arts, home economics, mechanical drawing, and art on the tenth grade level, and several business courses. GATB aptitudes, Form Perception (P) and Verbal (V) correlated significnatly with mechanical drawing grade point average (.621). The GATB was useful in the predictive role for ninth and tenth grade achievement in most of the areas studied. The authors state that few students in the sample were enrolled in the vocational and commercial curricula.

In his book The Validity of Occupational Aptitude Tests (1966) Ghiselli offers comprehensive information about the use of aptitude tests in success prediction. Prediger, Waple and Nusbaum (1968) review the available research pertaining to prediction of success in secondary vocational-technical programs. In general, they agree with Ghiselli, in that they found variations in results from study to study, prediction differences for males and females, and low predictor value for dexterity tests.

Weiss et.al., (1966) describes the rationale for selecting the GATB as the instrument to be used for measuring vocational abilities for the theory of work adjustment. Research on the GATB has indicated that a relationship exists between this battery and vocational counseling criteria in general, and specifically with measures of satisfactoriness.

Desmond and Weiss (1970) developed and analyzed the Minnesota Job Requirements Questionnaire (MJRQ) as a more efficient method for measuring the ability requirements of specific jobs. The questionnaires were mailed to 344 supervisors who had participated in a previous study. Analysis of the MJRQ ratings included internal consistency reliability scales, scale intercorrelations, and occupational group differences. Comparisons of Occupational Ability Patterns (OAPS) of the MJRQ and the GATB were made for eleven different jobs.

The authors concluded that the results of the study provided evidence for reliability, consistency and internal validity of MJRQ ratings. Dictionary of Occupational Titles (DOT) OAPS indicated that this method of determining ability requirements of particular jobs was possible and deserved further research.

Vessey and Hendel (1970) studied the effects of lower reading levels and a revision using easier words on the description of the Likert format on responses to the Minnesota Job Requirements Questionnaire (MJRQ) The MJRQ defines the ability requirements of a job in terms of the nine GATB aptitudes. This study attempted to improve the MJRA in three areas; reading level, description of the K (Motor Coordination), F (Finger Dexterity), and M (Manual Dexterity), and change the wording of the descriptors on the Likert Type response choice.

The authors concluded from the results of this study that the lower reading level and revised wording of the descriptions was an improvement over the original version. The revised wording of the descriptions of the K, F, and M abilities increased the differentiation between these abilities.

Enderlein and Enderlein (1973) examined the relationship between grade nine GATB scores and choice-of-study and the criterion measure. The Ohio Trade and Industrial Education Achievement Test (OTAT) was used with a sample of eleventh grade vocational students in 11 different shop areas. The results indicated that the cognitive variables of the GATB were related to shop performance whereas the manipulative portions were not related to shop success measured by the OTAT. However, it must be pointed out that the GATB measures nine different aptitudes; and it is assumed that different aptitudes are required for success in different occupational areas.

Occupational Values. The occupational values of the individual are related to the satisfaction a person derives from work. It is this value system which determines the nature and environment of the work situation suitable for the individual. Thus, an indicator associated with occupations and the values which they fulfill was considered important in this study.

In recent years, occupational values have received much attention, and studies of the occupational values of adolescents have probably outnumbered those concerned with occupational interests. This increase in the study of occupational values was probably due to the concept of values as predecessors to interests as indicated by Katz (1963).

Rosenberg (1954) conducted extensive studies on values. As a result of these studies three value-complexes were developed; the self-expressive complex, the external-reward complex, and the interpersonal complex. Since it was found that occupations were distributed across the three value complexes it may be assumed that persons classified into a value complex could be expected to choose an occupation related to

that complex. Thus, if a persons value orientation was congruent to that of the occupations, he was less likely to change jobs. Also, it was determined that those individuals that placed high values on salary were likely to choose an occupation which contained possibilities for high earnings.

Dipboye and Anderson (1959) conducted a study which investigated value rankings of ninth and twelfth grade high school students. The sample consisted of Central New York students attending school in urban, suburban and semi-rural areas. Sex, when used as a variable, did not appear to affect the results. However, when the groups were compared, differences did appear for the mean rankings of the individual values. Of the nine values studied, Interesting Work and Security were ranked one and two by all groups. From the findings of this study, the authors conclude that values are generally well formed by grade nine and remain constant during the high school program. Therefore, the inclusion of the values in the model for ninth grade students is somewhat supported.

Thompson (1966) conducted a study which examined the change in occupational values from ninth to tenth grade for a sample of high school students. The analysis of the data revealed no differences when analyzed with both males and females. However, when sex was used as a variable, differences were found. The girls rated social service and self-expression high, whereas the boys placed high value on salary, leadership and recognition. Gribbons and Lohnes, in their work Emerging Careers (1968), found that value awareness increased with time for the sample of high school students, indicating that values do change and are not as stable as reported earlier.

Satisfaction and Interest values were most important through the high school experience and decreased somewhat at the 2 year follow-up. Males placed high values on career-related indicators whereas females ranked social values highest, thereby indicating some sex differences similar to those reported by Thompson (1966).

In examining the relationship between work experience and vocational needs, Gay and Weiss (1970) administered the Minnesota Importance Questionnaire (MIQ) to 1620 subjects. The MIQ is an instrument designed to measure 20 vocationally-relevant need scales. The data were analyzed to determine whether individuals who possessed varying amounts of work experience, in terms of years, possessed different vocational needs. The results indicate that a person's specific level of vocational needs vary with amounts of work experience, and that the overall level of vocational needs also differ. In addition, the results also indicate that more work experience results in a clarity of an individual's need structure.

Socioeconomic Status. An important factor in the vocational development of an individual is the family. The social classes to which individuals belong affect their attitudes toward their occupations. Individuals from a particular class are described as having common values systems and patterns of behavior that correspond with these attitudes. The literature reviewed here provides information about the effects of socioeconomic background in relation to the model used in this study.

Hollingshead (1949) was one of the first to isolate and identify status as a distinguishing variable. He found that work attitudes of students and young people correspond closely with those of their parents and their social class.

Gardner (1950) states that persons from professional or business family backgrounds often experience difficulties in adjusting to jobs as waitresses or factory workers, since their families encourage upward social mobility.

Paine, et.al., (1967), in an attempt to understand vocational choice and job satisfaction further, investigated the relationship between family background characteristics and expected work values for college undergraduates. The data were collected from 155 male undergraduates at the University of Maryland in the form of a three-part questionnaire which included work values, perception of family background characteristics and family information. The results of that study indicated that a relationship exists between work values and family background characteristics. Family social activities had a positive relationship with values of independence, prestige, and responsibility, whereas a negative relationship existed between the number of times a family moved and these three values. A positive relationship was indicated between family income and work value pay and a negative relationship with security needs. The authors conclude that work values seem to be related to the family background of the individual.

Garbin, et.al., (1970) investigated problems of youth in their transition from high school to the work world. The two objectives of

the study were to describe the problems of work adjustment with empirical data and to make appropriate recommendations to alleviate these problems.

Data were collected through interviews with 642 workers, ranging in age from 17 to 27 years, from three cities. The respondents represented four groups, white collar high and low and blue collar high and low. Data revealed that more white collar workers than blue collar workers had parents who attended some type of post-secondary educational institution. The data also revealed that parents of the highly skilled groups of both white and blue collar achieved a higher level of formal education than either of the less skilled groups.

The years of formal education completed by individuals in the sample was greater than that of the parents in either group. Three times as many of the respondents completed high school as their parents.

Curriculum. Curriculum was included in the model since is represented the treatment effect the student received in the formal school experience. Therefore, the curriculum may be viewed as preparation for the adult experience and the work world.

Eninger (1965) conducted a national survey in an attempt to describe the occupational, educational and related experiences of graduates from trade and industrial schools for three five-year periods from 1953 to 1962. He also attempted to compare the experiences of vocational and academic graduates in the same classes and schools. Data were collected via questionnaires from 5,327 vocational and 1,780 academic graduates who attended 100 high schools in eight selected geographic regions of the United States. Analysis of the data revealed no

significant difference in the total number of full-time jobs held by academic and vocational graduates, nor was there a significant difference in their job satisfaction.

Eninger (1967) in a similar study compared the New York State data with a national sample. The national sample consisted of trade and industrial education graduates from 100 selected high schools, while the New York State sample consisted of eight schools which closely approximated the national sample. The author reported that the vocational graduates exhibited a high level of employment security and felt that they were well-prepared for their chosen occupations. In the area of job satisfaction, it was found that graduates who entered jobs for which they were trained, or that were highly related to their training were more satisfied with their jobs than were graduates in jobs unrelated or only slightly related to their training.

Kaufman and Lewis (1968) studied the general effect that vocational education had upon secondary students in three selected cities in the state of Pennsylvania. The sample included a small city, a medium city, and a large city in terms of population. These cities were selected because their existing vocational programs were above average. Therefore, the sample represents the upper range of vocational preparation. The data were collected by visitation reports by teams of experts; census data; interviews with graduates; and evaluation of graduates' job performance by job supervisors. Analysis of curriculum data indicated that the vocational sample had higher than average earnings. In addition, the vocational graduates reported that they were better prepared for their first jobs and were as satisfied with their jobs as were graduates of the other curricula studied in the sample. A seven-point

rating scale was used to assess job satisfaction. In addition, an instrument called a Job Description Index was used as a validation measure. No difference existed on the Job Description Index scores among the curricula or between the sexes, other than promotional opportunity for which the males indicated a more positive description.

Johnson and Johnson (1972) conducted a follow-up study of 1191 students three years after their graduation from three inner city schools. The data were collected by means of a questionnaire. Of those who responded to the questionnaires, about 40 percent were employed full-time. Again, analysis showed that the ratings of job satisfaction were significantly better among those employed in occupations which matched their high school preparation than were those who were employed in unmatched jobs.

Grade Point Average (GPA). Since success in school is measured by grades received, it seems proper to assume that the more satisfied an individual is with the school environment, the higher the obtained level of achievement. Success in school, as measured by grades, has long been thought to predict success after graduation. It was therefore decided to include grade point average in the model as a measure of in-school success.

Lewis and MacKinney (1961) conducted a study in which they attempted to predict job satisfaction using two approaches: counselor predictions, and predictions made using statistical data. The sample included 77 men who graduated from the engineering curriculum at Iowa State University. An eight-item general job satisfaction questionnaire developed at Iowa State was used as the criterion. The return rate was 91 percent, or 70 returns from the 77 mailed.

The predictor variables included interest inventories, college entrance exam scores and college grade point average at graduation.

The results of the analysis indicated a relationship in the negative direction between grade point average and job satisfaction. However, this relationship was not significant at the 5 percent alpha level.

Brenner (1968) used high school data as predictor source variables of work performance on the job. The sample included 100 subjects employed in an aircraft plant. Data obtained from the high school transcripts included teacher ratings of work habits and cooperation, absenteeism and grade point averages. Work-performance data included supervisory ratings, absenteeism and tardiness.

The results showed that significant relationships existed between high school variables and indicators of work performance. Grade point average was found to be positively related to the teacher's ratings and to supervisory ratings, the indicator of work performance. Class ranking had a high positive correlation with grade point average indicating grade point average to be a stable indicator of success.

Coppedge (1969) investigated the relationship between high school grade point average, composite scores on development and mental maturity tests, and teacher ratings of industry, initiative and responsibility and occupational or college success.

The sample consisted of 86 percent of the respondents to 201 questionnaires mailed to a population of high school graduates from a western state. Of those who responded, 108 were in college and 100 were employed. Data for the predictor variables were collected from high

school records and teacher ratings while the student was in grade twelve. The criterion variables were college grade point average, employer ratings, and salary.

The results indicated no significant relationships between the predictor variables and occupational success. There were, however, significant relationships between the variables and college success. The author concluded that, in light of the lack of relationship between the predictor variables and occupational success, a search should be conducted to uncover more relevant variables. Further, it was concluded that those variables suitable in predicting academic success may not be suitable for indicating occupational success.

In a study reviewed in a previous section, Johnson and Johnson (1972) found that those individuals who were rated as satisfied in the work world had had higher rankings in their high school class. In addition, these individuals gave more credit to their high school preparation than the dissatisfied group did, thus indicating a positive relationship between success in high school and success on the job.

Vocational Maturity. The selection of an occupation is related to the knowledge and information an individual possesses about the work world. Since success in an occupation is related to the correspondence one has with the work environment, it seems logical to assume that the more an individual knows about the world of work, the more appropriate will be his/her occupational choice. Few studies have been found which directly relate to vocational maturity and occupational success; therefore, this review will be primarily concerned with studies which dealt

with or used the Vocational Development Inventory (VDI) developed by John Crites, since that was the instrument used in this model to assess vocational maturity.

Super (1955) was the first researcher to introduce the concept of vocational maturity. This construct was used to denote the degree of vocational development an individual possesses through the various developmental life stages.

The two stages of vocational maturity identified by Super are:

> Vocational Maturity I focuses on life stages and is indicated by the actual life stages of an individual in relation to his expected life stage (based on his chronological age). Vocational Maturity II focuses on the developmental tasks and is represented by the behavior of the individual in handling the developmental tasks with which he is coping (Super, et.al., 1957, p. 57).

Crites (1961) defines vocational maturity, as measured by the VDI, as that construct which "refers to the maturity of an individual's vocational behavior as indicated by the similarity between his behavior and that of the oldest individuals in his vocational life stage (p. 256)." The VDI is designed to measure the affective elements of vocational maturity and, therefore, deals with vocational maturity in the same manner as Super's Vocational Maturity II.

Crites (1965) reported evidence of the validity and reliability of the VDI and discussed its development. In a monograph, he stated, that there was "finally conclusive evidence that the vocational attitudes measured by the inventory are general in nature, not being affected by either sex or school differences, and that they are more closely related to grade than age" (p. 27).

Crites (1969b) found that vocational students tend to score lower on the VDI that do academic students of the same grade level.

Socioeconomic background and intelligence tend to correlate positively with vocational maturity, as measured by the VDI. It was interesting to note that no sex differences existed in maturity as measured by the VDI.

Hollender (1971) reported a study in which he tested the assumption that vocational decisiveness increases with age (during adolescence) and intelligence. The study was cross-sectional, including 5200 students in grades 6 through 12 in a midwestern city. The expressed vocational choices of the sample were obtained by written responses to the question, "What occupation do you plan to enter?" (p. 244). Students who had no occupational choices were instructed to respond as "undecided." This question was used to assess the student's expectation of, rather than his aspiration to, an occupation. The intellectual ability data were obtained from school files.

The responses were classified as either decided or undecided. Using this response dichotomy as the dependent variable, chi-square analysis was used to examine the association between decision and age, school grade, sex and intellectual ability.

The results of this analysis indicate that no significant differences existed between the sexes. Also, there existed a lack of association between decision and age; however, a significant relationship was found to exist between decision and school grade in most cases. The ability variable showed an increase in vocational choice from the less able to the more able students. The author concluded that the more intellectually able student usually expresses a vocational choice prior to adolescence, through more knowledge of self and the environment, and that vocational development probably does not occur for these students during adolescence.

In a similar study, Cox (1971) investigated the relationship between educational success during the training experience and an overall measure of vocational success.

The sample consisted of 453 students who were between the ages of 18 and 21 when they attended any one of the 15 selected private trade, technical, and business schools during the 1962-63 school years. The students in the sample had also indicated, on a follow-up questionnaire one year after graduation, that they had completed the training program. Five years later questionnaires were mailed to the members of this group in order to obtain vocational success information. The predictor variables included the VDI score, Dailey Vocational Tests, and instructor's ratings; all of which were obtained during the 1962-63 school year, while the sample was in school. Both zero-order and multiple correlations were used for the data analysis.

The results indicated that there were no significant correlations at the .05 level of confidence for the total sample, the trade-technical school males or the males from business schools. However, four of the predictor variable correlation coefficients, including the Vocational Development Inventory, were significant at the .05 alpha level with the criterion for the business school females. These correlations were in the positive direction, thereby indicating that an increase in the magnitude of these predictor scores is associated with a corresponding increase in the criterion, vocational success. The multiple correlation was also significant at the .05 level. The two variables which contributed to the significant multiple R were instructor ratings and the Vocational Development Inventory.

The author concluded that vocational success was more predictable for females than for males with this set of factors. This study also supported the premise that educational measures have limited utility in predicting vocational success.

Occupational Satisfaction. One of the primary indicators of work adjustment is occupational satisfaction. As has been stated, occupational satisfaction indicates the degree to which successful correspondence between the individual and the work environment has been achieved. Once achieved, the results are varied, and the returns are positive to the individual, the employer and society. This satisfaction includes an overall satisfaction for the individual, as well as satisfaction with a particular aspect or aspects of the occupational environment. That is, occupational satisfaction seems to be associated with increased salary, advancement, positive supervisor and co-worker evaluation, length of employment, and the utilization of one's ability to the highest possible degree. Occupational success was the criterion variable to be used in the model for this study. The Minnesota Satisfaction Questionnaire (MSQ; Weiss, David, England and Lofquist, 1967) was used as the measure of one of the basic indicators of work adjustment. Therefore, this review will be primarily concerned with studies which utilized the Minnesota Satisfaction Questionnaire.

Davis, et.al., (1967) conducted a study in which job satisfaction (employee) was used as a moderator variable, and ability test scores were used to predict job satisfactoriness (employer). That is, if satisfaction operates as a moderator, satisfactoriness (predicted from ability scores) was expected to increase for higher levels of satisfaction. The sample consisted of 169 males and 183 females employed at a

large manufacturing plant. The MSQ was used to measure job satisfaction, as indicated by average productivity and supervisor evaluation. Abilities were assessed with the use of eight ability tests. Linear multiple correlation was used in the analysis. Data for each sex were divided into thirds, according to the scores on the MSQ, and analyzed separately.

The results for the male group yielded coefficients of .63 and .69 for the high satisfaction subgroup, while the low and middle subgroups yielded multiple R's ranging from .34 to .52. The results indicated that for the female group, too, the hypothesis was partially supported. The author cautions the interpretation of the results due to the absence of any cross-validation.

Taylor and Weiss (1969) conducted a study in which they attempted to make predictions of employee turnover and test the predictions in cross-validation. The sample consisted of 467 employees of a discount store chain. The procedure consisted of administering the MSQ to the sample in the Fall of 1967. One year later, the company was contacted to determine which of the employees who had been tested were still employed by the company. Of the original 475 in the sample, 93, or about 20 percent had terminated. For the analysis, the sample was randomly divided into development and cross-validation groups. The biographical data were analyzed for the two groups and no differences were found between them. A discriminant function analysis, using MSQ scores and biographical data as predictors and stayed-left as the criterion, was performed. The results indicated that those individuals exhibiting a high probability of learning were identifiable using the MSQ scores.

Anderson and Weiss (1971) conducted a study in which they tested the stability of measured work adjustment. Job satisfaction measures were obtained with the use of the MSQ and job satisfactoriness was measured using the Minnesota Satisfactoriness Scales (MSS). The sample consisted of 1508 adult men from six occupations. Measures on the two variables were taken over a two-year period to test employment stability. Those individuals identified as stayers, 70 percent of the total sample, were those who were still on the job with the same employer for this two-year test period. The stayers indicated only moderate stability for all measures. Occupation, age and tenure was found to be related to stability for stayers.

The results indicated that, for stayers, relationships exist between initial satisfaction level and stability of measured satisfactoriness. The reverse relationship also existed for the leavers. These data supported the hypothesized relationship that these variables are related to stability on the job.

Gray and Weiss (1971) reported a pilot study in which the initial phases of the modification of the MSQ were described for use with mentally retarded adults. The study was divided into three phases: converting items on the test to pictoral (facial expression) form, lowering the reading level of the items, and examining the construct validity of the revised instrument.

The subjects in the sample consisted of 131 nonretarded clients of a state division of vocational rehabilitation. The instrument consisted of two parts. Part one consisted of five cards, with one MSQ response and 11 faces, and part two consisted of 11 cards, with one face and

five MSQ responses. The subjects were asked to match the appropriate face with the response or the response with the face wherever appropriate.

The second phase of the study involved individual administration of a first revision of the MSQ to 15 retarded employees of a local sheltered workshop. The findings of this test were used to revise the questionnaire.

The third phase of the study consisted of examining the construct validity of the revised MSQ. Additional measures of satisfaction were obtained in the form of ratings of the employee's job satisfaction, as perceived by the supervisor. The subjects for this phase consisted of 24 retarded adults.

The results indicated that the faces format can be used appropriately in measuring job satisfaction for this group.

Literature Relating to Path Analysis

The statistical methodology, path analysis, was developed by Sewall Wright during the 1920's. Path analysis has formally been applied to genetics, and has yielded coefficients useful in theoretical deductions. Little work has been done using path coefficients to estimate the paths. This analysis may account for a set of observed relationships based on the assumption of the causal ordering of the variables involved. This problem is inverse to that of genetic deduction. That is, the criterion variable exists and the explanation of its factors in the form of a causal model represents this inverse relationship. Another area in which path analysis has been used was econometrics. The rapid production of the digital computer, with its massive capacity for handling

data, and the speed by which it processes such data has lead to an increase in the use of more multivariate analysis methods for the statistical analysis of data. In the social sciences, longitudinal data are being gathered and models are being developed and tested using series data. However, such usage is still just beginning, and the review reflected this fact. The studies reported here are not directly related to the proposed model, but they represent the use of the path analysis methodology utilizing other models in the social sciences.

Duncan (1968) conducted a study in which the objective was to synthesize knowledge concerning factors which affect occupational achievement. Causal models based upon the socioeconomic life cycle were developed for this study. Data was collected from six major sources and analyzed, using these models, with the Path Analysis Technique.

The results indicate that family socioeconomic status and educational attainment influence the level of the individual's occupational status. The basic model was expanded to include variables such as national origin, race, family size, family stability, and various intervening variables, career contengencies and other outcomes. The emphasis of this project was upon the synthesis of the results through systematic interpretation, rather than upon specific findings. The author stated that the Path Analysis procedure held promise for future research.

Howell (1970), in a sociological thesis, tested existing causal models of occupational achievement. The sample used in this study consisted of approximately 800 males. An analysis of the paths in the causal model indicated that early measures of intelligence indirectly correlated with adult occupational attainment, through achievement variables measured by grade point average and educational level, status of

first employment and further education. It was also found that father's educational level affected one's occupational attainment indirectly, again through educational level and status of first employment. The author concluded that since the indirect effect was larger than the direct effect of these variables, there existed an additive effect of the antecedent variables on occupational achievement.

Featherman (1972) reported a study in which achievement-related orientation may influence male attainment of occupational, educational and economic status. This study was part of a series in which the effects of motivation were examined in relationship to generated mobility.

The sample consisted of data from three panels of the Princeton Fertility Study conducted in the United States over the years of 1957-67. The sample size for this study was 715 males. Data were collected in 1957, in 1960, and from 1963 to 1967. The variables used in this study included the father's occupation, educational attainment, family size, occupation and income at each time. Measures of achievement-related motivations were constructed from attitude data collected in 1957, and used as intervening variables. Utilizing these variables over the three points in time a recursive causal model was developed and the effects of these variables upon income in 1967 were tested using the sample data.

The results of this analysis indicate that contrary to the assertion of some social psychologists, there was no support for the hypothesis that achievement orientations are relevant to status attainment or

its process. The author adds that this lack of support may have been due to inadequate measurement rather than the invalid constructs in the model.

Picon and Walker (1972) conducted a study in which they examined the differential influence of socioeconomic status and the significant influence that others, such as parents, teachers or friends, have on the educational aspirations of youth, both black and white. A recursive causal model was developed from related research and analyzed, using the Path Analysis Technique. The sample used was composed of about 300 southern high school students.

The results indicated that the influence of others on educational aspirations was stronger for white respondents than it was for black respondents. The authors note, however, that many important variables which could have been included in the model were omitted and suggest the need for further research in this area.

In a study conducted by O'Reilly (1973), Path Analysis was used to examine the effect of 21 student characteristic variables pertaining to the student's expressed occupational choice in 12th grade. The sample selected in this study was composed of 550 male and female students from a large eastern high school, and the data were collected when the subjects were in ninth, tenth, and twelfth grades. These data included measures of ability, aptitude, achievement, values, and socioeconomic status. The criterion variable was occupational choice collected during the final testing period, twelfth grade.

The original causal model was revised to utilize 12 of the original 21 variables with the criterion. This model was then tested, using the data collected from the sample.

The results of the analysis of this data indicate that none of the variables investigated were able to discriminate between those who express an occupational choice and those who do not. The stability of occupational choice seems to be indicated by the stability of occupational choice from ninth to tenth grades. It was noted that socioeconomic status, sex, or level of occupational choice did not effect stability of occupational choice for the sample in this study.

Summary of Literature Review

The components of worker satisfaction and the achievement of satisfaction have been investigated by many researchers and psychologists.

Hoppock (1935) developed criteria by which a global measure of job satisfaction could be obtained. He defined job satisfaction as the attitudinal relationship between an individual and the environment. It seems, then, to be a measure of an individual's ability to adjust to the environment. Once this is accomplished in a satisfactory manner the individual is likely to experience job satisfaction.

Vroom (1964) proposed a theory of human motivation within the world of work, often referred to as the Valence-Force Theory. In the terms of this theory, job satisfaction reflects the valence of the job for the worker. The strength of this valence is related to the length of time a worker stays on the job.

In still another approach, Herzberg, Mausner and Snyderman (1959) were concerned with the causes of job satisfaction and dissatisfaction. Variables which contributed to satisfaction and dissatisfaction were associated with the concepts of intrinsic and extrinsic work properties. These work properties were classified into satisfiers and dissatisfiers.

Satisfiers, those variables which lead to job satisfaction, are usually intrinsic factors and act as individual motivators. Conversely, dissatisfiers are usually factors which are extrinsic to the job or hygiene factors, since they are necessary to maintain the status quo but do little to improve satisfaction. The model has been named Herzberg's Two-Factor Theory, because the variables operate in opposite directions.

The Theory of Work Adjustment proposed by Davis, England, and Lofquist (1964), and by Davis, Lofquist, and Weiss, (1968) is a conceptual model developed in an attempt to describe, predict and facilitate work adjustment. This theory is concerned with the way an individual progresses through the work adjustment process. The work adjustment process is identified as the interrelationship between the individual's work personality and the work environment. The work personality refers to the individual abilities and needs, whereas the work environment reflects the ability requirements and the need reinforcers. The outcomes of successful completion of the process are satisfaction, satisfactoriness and tenure.

Literature which related to the utilization of the variables in relation to job satisfaction was reviewed. This review indicated that sex differences may exist in terms of job satisfaction; however, no conclusive evidence in either direction was uncovered. Since abilities are usually related to job requirements, the General Aptitude Test Battery (GATB) was found to be related to satisfaction in a number of studies. This battery shows evidence of valid measurement of vocational abilities for the work world. No clear cut pattern was found to exist as to what

abilities discriminate between satisfaction and dissatisfaction. Also, the stability of the GATB over time supports the inclusion of these measures at grade nine.

The studies reviewed indicated that occupational values are related to the satisfaction a person derives from the work world. Sex differences were found among value rankings, although the value Interesting Work seemed to be common to both sexes. The females ranked social service high, whereas the males valued salary and recognition. The analysis of the review indicated that values are generally well formed by grade nine and are stable throughout the high school years.

Since the work of Hollingshead (1949), socioeconomic status has been used as an independent variable in the investigation of numerous topics, including job satisfaction. The material reviewed seems to indicate that a relationship exists between family background and perceptions of the work environment. That is, the higher the socioeconomic status of the family, the more likely the individual would be to aspire to that level. He or she, furthermore, would usually find difficulty in functioning in roles not commenserate with that status level.

The finding which appeared most was that those students who were employed in occupations related to their training seemed to be the most satisfied in terms of their work. Studies reviewed concerning the achievement variable included in the model, grade point average, did not provide convincing evidence that in-school success measured by grade point average is related to success on the job. It is pointed out, however that those variables used to measure in-school success do not seem to be suitable measures of occupational success.

The Minnesota Satisfaction Questionnaire (MSQ) was used as the measure of job satisfaction in this study. The review of related literature concerning this variable indicated that it is a valid measure of job satisfaction. In addition, the MSQ was also found to be useful as a predictor variable in a study concerned with job tenure.

Super (1969) suggested the use of Path Analysis as the next logical step to be taken by researchers in the social sciences. The application of this methodology is still at an early stage but its use is increasing as more and more researchers are becoming familiar with the technique. The review points out the usefulness of Path Analysis and its uniqueness in analyzing time series data. Moreover, Path Analysis permits the examination of the stability of a construct over time. The researcher furthermore, is able to identify the effects, both direct and indirect, of antecedent variables upon the variable in question. The review suggests that this technique is useful and that it is gaining in popularity as a research tool in the social and behavioral disciplines.

III

PROCEDURE

Population and Sample

In this study an attempt was made to utilize a population which closely approximates the average high school population in the United States. This attempt was deemed important so that future investigations could be conducted using this model with another similar sample for validation. It must be cautioned that the results of this study that can be generalized are limited, outside the actual population. If a generalization is made, an attempt must be made to determine that these two groups are similar.

The population from which the sample was drawn consists of the entire ninth grade enrollment of the public school system of the city of Altoona, Pennsylvania, during the 1968-69 school year. The ninth grade population during that year was approximately 1,100 students.

The Altoona Area School District was classified as a second class district on the basis of serving a population of approximately 70,000 people. This school district consisted of a jointure of the city and the surrounding Logan Township with an estimated student population of 15,000. The six-three-three plan of school organization utilized a number of elementary schools, three junior high schools, and one central senior high school. The vocational curriculum was housed in the senior high school until the 1970-71 school year. At that time the facilities of a new vocational-technical school were occupied. The Altoona

expenditure for the 1968-69 school year was approximately $622 per student, whereas the average instructional costs per student throughout the state was approximately $680 for the same year.

The economic structure of the city of Altoona was historically based on the activities of the Pennsylvania Railroad until the railroad's decline about 1950. As a result of this decrease in employment opportunity with the railroad, active community groups were formed that successfully attracted diversified industries into the community. Consequently, the economic base of the community has stabilized and variations in the size and make-up of the industries resulted in a population which approximates the total socioeconomic scale.

All data for this study were collected as part of a continuing longitudinal study of career development. This study is currently being conducted by the Department of Vocational Education at The Pennsylvania State University, in cooperation with the Research Coordinating Unit of the Pennsylvania Department of Education. The Vocational Development Study (VDS), was initiated in 1968, and the initial data were collected during the spring of 1969, when an attempt was made to include all ninth graders in the Altoona public school system.

The data for this study utilized data collected from the one-year after-graduation follow-up of the Altoona group.

Follow-up Procedure

A one-year after-graduation follow-up for the Altoona sample was conducted during the 1972-73 school year. The last in-school contact with this sample was during their senior year, 1971-72, at which time a two-part questionnaire was developed and administered. The first part

provided the staff with information helpful in locating individuals after their graduation, including current addresses, parent or guardian addresses, and addresses of persons who were likely to know the future whereabouts of the respondents. The second part provided information about the student's high school experience, as well as his aspirations for the future.

With the help of these data, and in an attempt to maintain an up-to-date mailing list, each member of the sample was mailed a birthday card, at the appropriate time during the 1972-73 year. Included with the birthday card was a return self-addressed card that contained a message asking the individual to correct the current address, if in error, and mail it to the project office.

Concurrently, with the updating of the mailing list, a four part, two page questionnaire was developed and printed in standard answer sheet form. A sample of this questionnaire is included in Appendix A. All respondents were instructed to complete Part A of the questionnaire, and the one most appropriate additional part. Those in school were instructed to complete Part B; those employed, to complete Part C; and those unemployed, to complete Part D.

Figure 2 contains the flow diagram of the questionnaire mailing strategy. The packet contained:

1. The questionnaire - printed on white paper using light green ink and green shading (sample attached at end of paper).
2. Stamped return addressed envelope.
3. Pencil inscribed with the words - The Pennsylvania State University.

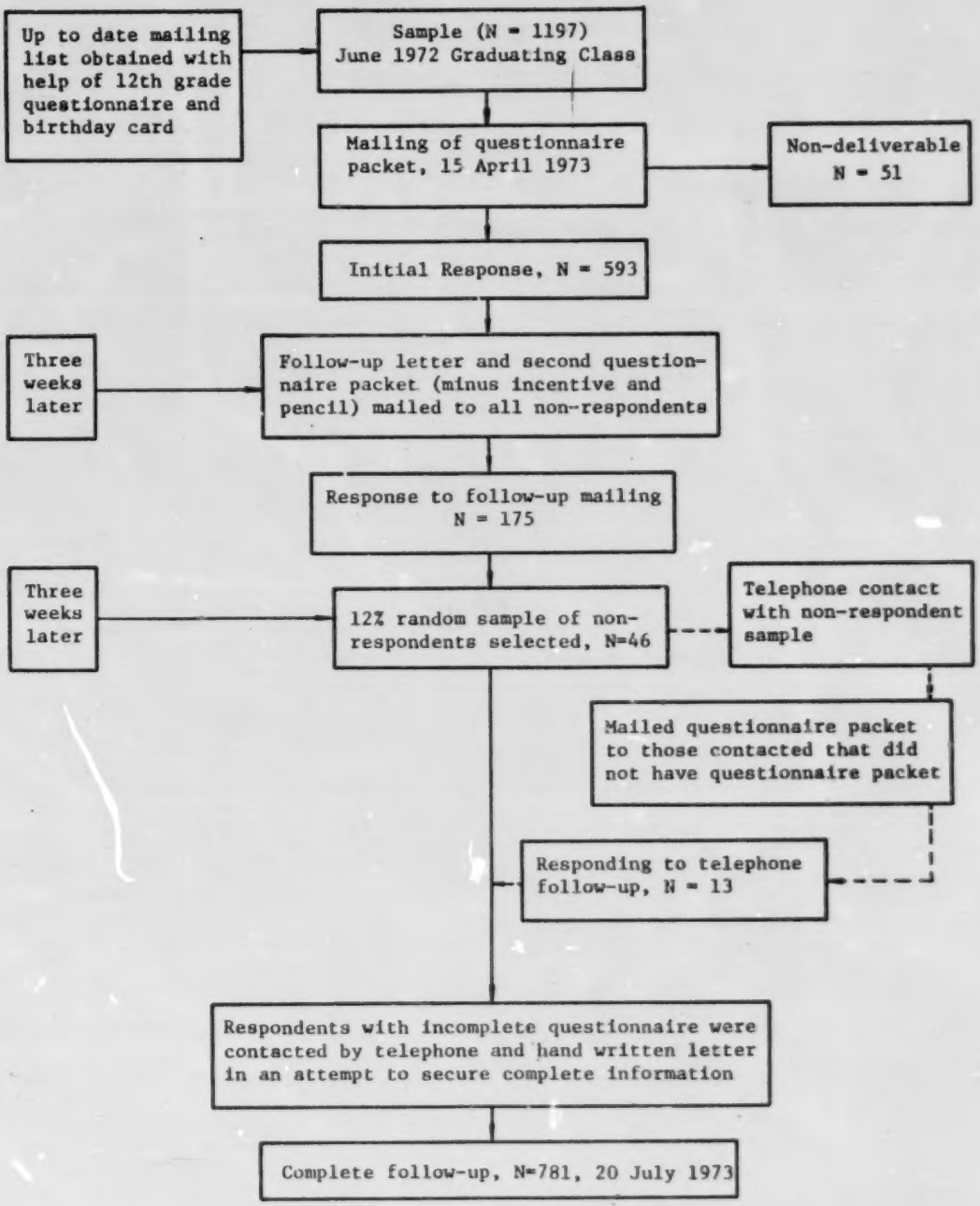
Up to date mailing list obtained with help of 12th grade questionnaire and birthday card
Sample (N = 1197) June 1972 Graduating Class
Mailing of questionnaire packet, 15 April 1973
Non-deliverable N = 51
Initial Response, N = 593
Three weeks later
Follow-up letter and second questionnaire packet (minus incentive and pencil) mailed to all non-respondents
Response to follow-up mailing N = 175
Three weeks later
12% random sample of non-respondents selected, N=46
Telephone contact with non-respondent sample
Mailed questionnaire packet to those contacted that did not have questionnaire packet
Responding to telephone follow-up, N = 13
Respondents with incomplete questionnaire were contacted by telephone and hand written letter in an attempt to secure complete information
Complete follow-up, N=781, 20 July 1973

Figure 2. Flow Diagram of Questionnaire Mailing Strategy.

4. One incentive - a combined key chain screwdriver - one side imprinted with the zodiac and the other inscribed - VDS Project Penn State 1973.
5. One ticket - to be filled out and returned with the questionnaire to be used in a raffle drawing. The drawing prizes included a portable color television, six AM/FM clock radios, and 35 pairs of major league baseball tickets.
6. Cover letter - printed on buff color paper and fully explaining the follow-up questionnaire.

Consideration for the use of incentive and colored ink and paper were made with reference to an article describing follow-up research by Pucal, et.al., (1971) concerning incentives and responder characteristics.

After a three week period, a second packet was mailed to the non-responders. The packet was identical to the original; however, it did not include a pencil or the incentive so as not to provide positive reinforcement for non-responding. After a second three week period elapsed, an attempt to sample the remaining non-responders (a 11 percent random sample) was undertaken in hope of obtaining enough returns to compare responders and non-responders. This sample was contacted by telephone and encouraged to respond. Another questionnaire packet, minus pencil and incentive, was then supplied to those contacted by telephone who, for whatever reason, did not have one.

If a questionnaire was returned containing incomplete information, the respondent was contacted by telephone and/or a hand written letter and asked to supply the missing information. The total time for this

procedure extended from 15 April 1973 to 20 July 1973 or a period of about three months. Table 1 provides the return results of the follow-up.

Table 1. Response to Altoona Follow-up Questionnaire for Class of 1972.

Action	Number
Initial Mailing	1197
Non-Deliverable	-51
Sub total	1146
Total Graduates	1056
Total Dropouts	90
Initial Mailing Response	593
Response to Follow-up	175
Response to Telephone Follow-up (12% of non-responders after follow-up [385] = 46)	13
Total returns	781
Percent of Total Returns (781/1146)	68%
Percent of Graduate Returns (Total graduate returns/total graduates) (752/1056)	71%
Percent of Dropout Returns (Total Dropouts) (29/90)	32%
Number of Returns by Part	
Part A	781
Part B	305
Part C	380
Part D	96

From Table 1 it is noted that 68 percent of those who were mailed questionnaire packets returned questionnaires. Upon tabulation of the return data, it was shown that 71.2 percent of those members of the

sample who graduated returned a questionnaire. It was interesting to note that 32 percent of the dropout group returned questionnaires. This percentage was quite high, considering that these were individuals who had severed their formal relationship with the school system before graduation. The attractiveness of the incentives may be one explanation for this response.

The overall 68 percent return rate and the 71.2 percent return rate of the graduate returns must be considered quite high in light of what is known about follow-up survey return rates. One can only speculate about the reasons for this. Perhaps it can be attributed to the continued personal contact with the sample through their high school careers by the VDS staff. In addition, surely the incentives must have added to the number of returns.

It can be concluded that personal contact and incentives indeed increase the return rate of follow-up surveys. However, it is impossible to conclude what proportion of this increase was due to these two factors.

The sample used in this study consisted of 208 males and females. This sample was determined by the 380 which completed and returned Part C of the questionnaire. Part C contained the criterion information, the Minnesota Satisfaction Questionnaire, to be completed by those who were employed, in an attempt to assess their job satisfaction. The reason for the sample shrinkage from the original 380 to 208 was incomplete data for any of the five points in time used in the model.

The following presents the composition of the total sample.

Curriculum	Males	Females
Vocational	57	4
Academic	29	41
Secretarial	1	32
Business	2	29
Home Economics	0	13
Total	89	119

For the purpose of this analysis, this sample was recategorized into two seemingly congruent groups by curriculum. That is, a vocational curriculum and a non-vocational curriculum were generated after an analysis of the content of these curriculums. The vocational curriculum consisted of vocational, secretarial, and home economics; while non-vocational consists of academic and business. The vocational curriculum is composed of those students who are in the vocational specialities, whereas the non-vocational curriculum is composed of those students who are very academic by course content (curriculum) and those in the business curriculum which is not college bound or work bound by the nature of the curriculum.

The composition of the two generated curriculums is as follows:

Curriculum	Males	Females	Total
Vocational	58	49	107
Non-vocational	31	70	101
Total	89	119	208

From this listing it can be seen that the generation of these two curriculums resulted in samples which are nearly equal size.

Essential Data

The data for this study were collected over a period of several years. Previous studies and analyses of workers satisfaction were reviewed in an attempt to provide rationale for the inclusion of certain student characteristics in the model. This process established that those characteristics selected had a relationship to job satisfaction, the criterion used in this study. The following is a description of the variables used and the method of measurement used or the rationale for their creation.

Sex. The research studies reviewed indicated that the individual's gender appears to be related to his or her employment satisfaction. Since males and females arrive at their first jobs in different manners, and since vocational development theory seems to concentrate on the males, it was decided to include the sex variable in the model to test the efficiency of the model for both males and females. For the analysis of the model, males were coded 1 and females were coded 2.

GATB G and M. The General Aptitude Test Battery (GATB) was chosen to be used in this study because it measures manipulative as well as cognitive aptitudes.

The GATB was first released by the United States Employment Service in 1947 for use in adult employment counseling and was later extended for use at the ninth and tenth grade level. Following revision in 1952, the revised version is made up of eight paper-and-pencil sub-tests and four manipulative-apparatus sub-tests. The entire battery takes about

two and one-quarter hours to administer. Extensive validity and reliability studies have been done on it, with the results indicating that the battery is reasonably valid and reliable.

The United States Department of Labor (1967) reported that, for the general working population, the mean for each of the nine aptitudes in the battery is 100 with a standard deviation of 20.

The validity of the battery is determined by the relationship between the norms and the criterion, expressed as a phi correlation coefficient. The types of validity computed are either predictive validity or concurrent validity. The type of criterion used includes work sample, school grades, supervisory ratings, instructor's ratings or production records.

The typical validity coefficient, reported from the results of studies conducted by the United States Employment Service, was approximately .22, regardless of the type of criterion used.

Reliability studies concerning the GATB aptitudes were conducted utilizing samples of high school, college and adult populations. Two types of evidence concerning reliability were sought: stability of measurements over time and form equivalency. The administration of the tests were conducted under standardized conditions with a range of one day to three years between testing and retesting. The results of these studies indicated that the reliability coefficients ranged from .80 to .90 for most of the GATB aptitudes. Two of the nine aptitudes measured by this battery were chosen for use in this study:

GATB-G - Intelligence: General learning ability; the ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgments; closely related to doing well in school.

GATB-M - Manual Dexterity: Ability to move the hands easily and skillfully; ability to work with the hands in placing and turning motions.

GATB-G was used in the model as a measure of intelligence, or the cognitive domain. GATB-M, a manipulative measure, was used as a measure of the psychomotor domain. These two measures may be treated as orthogonal or independent measures in the analysis. That is, they display a small relationship to each other.

Occupational Values. Occupational values seem to be related to the process of work adjustment. The work environment which the individual enters must supply the necessary reinforcement to her or his values and needs in order for that individual to be in harmony with the job.

The literature indicates that values, interests and needs appear to be a strong determinant of work adjustment. As a result of research concerning values, numerous assessment instruments for occupational values have been developed. From these, the Occupational Values Inventory (OVI) has been selected for use in this study. A monograph co-authored by Impellitteri and Kapes (1971) describes the development of this instrument and reports preliminary validation studies.

The internal consistency of the OVI scales was measured by the procedure recommended by Rabinowitz and Eikeland (1964). This procedure is an extension of Hoyt's (1941) method. Utilizing this method, the range of reliabilities over the seven scales, for both males and females in the sample, ranged from .72 for Personal Goal for the males, and .89 for Salary for the female sample.

Concurrent validities of the OVI scales were computed by their correlations with sex, the General Aptitude Test Battery, G score, college aspiration and choice of a vocational course of study in high school.

Significant correlations ranged from a -.18, for the value Personal Goal and choice of curriculum, to .29, for the value Interest and Satisfaction and GATB-G.

The unique contribution of this instrument is that it contains actual "valuing tasks" in an ipsative format. The tasks are phrased in a language easily understood by ninth grade students. The OVI assesses seven occupational values: Interest and Satisfaction, Advancement, Salary, Prestige, Personal Goal, Preparation and Ability, and Security. For the purpose of this study two of the seven values were selected for inclusion: Interest and Satisfaction, and Salary. These two values were selected because they represent a dichotomy. That is, it was felt that those who value Interest and Satisfaction were individuals who recognize the importance of the in-school experience in satisfying future needs. On the other hand, those who value Salary most are most readily satisfied in the world of work.

These two values are defined by Impellitteri and Kapes (1971) as:

Interest and Satisfaction - One likes the work; is happy at it; fulfills oneself by doing it.

Salary - One perceives the financial return resulting from the work; can make a good living at it; sees it as an opportunity for a satisfactory income (p. 13).

Kapes (1971) found the OVI to be a useful and valid instrument for assessing occupational values. Kapes noted that it is important to use

fewer than the total values, "because this instrument is ipsative it is necessary to include fewer than all of the values . . . . In order to allow the values to vary independently, . . ." (p. 72).

Socioeconomic Status. The two family background variables selected for this study were father's education and father's occupational level. Information concerning these two variables were obtained from the students' biographical information form while they were in the ninth grade. The validity of this information is dependent upon the accuracy of the student's knowledge of his or her father's occupation and education. The analysis was conducted with this in mind. The data about the father's education was obtained by asking the student to circle the highest number of years of education obtained by the father. The range of possible responses was from 1 to 16+. These data were then coded into seven categories. Students were also asked to write-in the present occupation of their father. These data were then coded into Roe's (1956) 6 levels. Information about the family's residence was not included, because of the difficulty in obtaining data about this variable. Mother's occupational level was not used because of the large number of non-working mothers in the sample, and mother's educational level was excluded since it has been shown to correlate highly with father's educational level (Super and Overstreet, 1960).

For this study, a two-factor index of socioeconomic status has been developed using the following formula: "Index of Social Position = 7 x Father's Occupational Level + 4 x Father's Educational Level" (Bonjean, Hill, and McLemore, 1968, p. 385).

This index was developed by Hollingshead and Redlich (1958). They state that, "The Index of Social Position was developed to meet the need

for an objective, easily applicable procedure to estimate positions individuals occupy in the status structure of the community." (Hollingshead and Redlich, 1958, p. 387).

Reliability and validity studies have been conducted by Hollingshead and others (Bonjean, Hill, and McLemore, 1968).

The variable father's education was coded according to the following seven categories:

1 = 1 thru 5 years

2 = 6 thru 8 years

3 = 9 thru 11 years

4 = high school graduate--twelve years

5 = one thru three years of college

6 = college graduate

7 = college graduate plus additional graduate studies

Father's occupational level was converted to the six levels of Roe's (1956) classification scheme. Since Roe used the low numbers to indicate the highest level of occupation and vice-versa it was necessary to invert these numbers in order to conform with the educational scheme for the purpose of statistical analysis.

The converted occupational levels are as follows:

1 = unskilled

2 = semi-skilled

3 = skilled

4 = semi-professional and small business

5 = professional and managerial II

6 = professional and managerial I

It is recognized that the two variables are not made up of an equal number of categories. However, since the 4 to 7 ratio is only an approximation, it was felt that this difference would not create any difficulties, and, therefore it was used.

Curriculum. Since curriculum represented the treatment the individual received in the high school situation, it was included in the model. It was decided to generate these two curricula for the purpose of this analysis. Those enrolled in the vocational, secretarial, and home economics curriculum were classified as vocational students. The non-vocational students were those enrolled in either the academic or the business curriculum. Kapes (1971) and O'Reilly (1973) both utilized a similar system for establishing curriculum as a dichotomy. These authors found this classification scheme both useful and valid.

For the purpose of this analysis, the vocational curriculum was coded 1 and the non-vocational curriculum was coded with a 2.

Grade Point Average (GPA). The achievement variable used in this model was GPA (ninth through the eleventh grade). The range of this variable is from 1 to 5 based upon the following categories:

A = 5
B = 4
C = 3
D = 2
F = 1

The GPA was computed by summing over all major subject grades and dividing by the number of subjects. This variable represents the student's success in school and was considered an appropriate measure of achievement.

Vocational Development Inventory (VDI). Super (1957) provides the following definition for vocational maturity:

> Vocational Maturity is used to denote the degree of development from exploration to decline. Vocational maturity may be thought of as vocational age, conceptually similar to mental age in early adolescence, but practically different in late adolescence and early adulthood because more distinctions can be made in the development curve at those stages (p. 186).

Theory relating to the construct of vocational maturity indicates that those who are more vocationally mature will be able to make more realistic occupational choices. It was felt that a more realistic choice would lead to an increase in job satisfaction.

Since this study is concerned with job satisfaction, it was necessary to include a measure of vocational maturity which could be related to satisfaction in the work world.

The Vocational Development Inventory (VDI) developed by Crites (1965) was the particular measure of vocational maturity selected for use in this study. The VDI consists of 50 statements, to which the individual responds in an agree or disagree format. The inventory can be administered in about 20 minutes, and the resulting score is interpreted with the aid of age norms to yield an index of vocational maturity.

The scores on the VDI range from 0 to 50. Norms established for Pennsylvania ninth grade students show a mean of 34.69, a standard deviation of 4.93, and a range of 19 to 47. In addition to studies conducted by Crites to validate the VDI, Pucel and others (1970) and Kapes (1971) have shown the usefulness of this instrument in studies involving vocational and technical students.

The Minnesota Satisfaction Questionnaire. The specific concern in this study is the relationship of in-school variables to post high school job satisfaction. Job satisfaction represents a congruent relationship with the reinforcer of individual needs, the work environment. The instrument selected to measure job satisfaction was The Minnesota Satisfaction Questionnaire Short-Form (MSQ) (Weiss, Davis, England and Lofquist, 1967). The short-form MSQ is self-administering, and there is no time limit. The responses are in Likert form ranging from Very Dissatisfied to Very Satisfied. This 1 to 5 response yields a range of scores from 20 to 100. The total score is determined by summing over the 20 items. The MSQ consists of three scales: Intrinsic Satisfaction, Extrinsic Satisfaction, and General Satisfaction. For the purpose of this analysis, the General Satisfaction scale was used.

The Hoyt reliability coefficient was used as an indicator of internal consistency. These coefficients were computed for six norm groups: Assemblers, Clerks, Engineers, Janitors, Machinists and Salesmen. The reliability coefficients for these groups was generally high. The median reliability coefficients obtained were .86 for Intrinsic Satisfaction, .80 for Extrinsic Satisfaction and .90 for General Satisfaction.

Since no data exist for the stability of the MSQ over time, stability for the General Satisfaction scale may be inferred from data on the same scale on the long form MSQ, since both scales use the same 20 items.

Test-retest correlations ranged from .89 over a one-week period to .70 over a one-year period for the General Satisfaction scale.

Concurrent validity on the MSQ was derived from the study of group differences in satisfaction. The total normative group means reported were 47 for the Intrinsic scale, 20 for the Extrinsic scale and 75 for the General scale. A one-way analysis of variance was used to test the difference in level of expressed satisfaction. Utilizing this procedure, statistical significance was found for the means on all 20 scales of the MSQ, indicating that this instrument can differentiate among occupational groups.

Analysis

The statistical methodology utilized in this study was path analysis. Path analysis methodology was developed by Sewall Wright, beginning in 1921, as a statistical tool for use in the study of genetics. Path analysis is a technique for examining interrelated variables in a causal model for which exogenous variables can be assumed to determine endogenous variables. Its purpose is to test the consistency of a proposed causal model. Path analysis attempts to specify linear equations that are related to the model. The correlations between the exogenous variables are not based upon any assumptions and are predetermined. The analysis consisted of the computation of path coefficients once the correlations were known, and the determination of the direct and indirect effect of the independent variables to the dependent variable.

In addition, this study also used zero-order Pearson Product Moment Correlations and multiple regression analysis (MRA). The

subjects, male and female, were used to test the model in three different analyses, (1) as a combined sample, (2) male sample, and (3) female sample.

The Pearson Product Moment Correlation was used to test the relationship between the exogenous variables, that is variables not determined by any other variables in the model, and the endogenous variables, which are determined by at least one other variable in the model.

DuBois (1965, p. 157) offers the following comments on the subject of correlation:

> Although correlations vary from .00 to 1.00 (and negatively from .00 to -1.00), they cannot be considered as proportions (or percentages). Basically, an r is merely the slope of the best-fitting, least square line, after the variance of the two variables have been equalized. Somewhat indirectly, r becomes a measure of relationship by indicating (when squared) the proportions of the variance in one variable predictable through knowledge of the values in the other.

Multiple regression analysis was used to reflect simultaneously the magnitude of the direct or unique effect expressed as a path coefficient (a standardized regression coefficient) on an endogenous variable for each exogenous variable. The multiple regression model used in this model is in the following form:

$$y = b_o + b_1 x_1 + b_2 x_2 + \ldots + b_k x_k + e$$

where

y = endogenous variable

$x_1, x_2, \ldots x_k$ = exogenous variable

$b_0, b_1, b_2, \ldots b_k$ = partial regression coefficient

e = error term

The particular equation used varies depending upon theoretical considerations and prior research on the effects of certain variables upon certain other variables.

Whenever one deals with a statistic, certain assumptions are made: The assumptions required for MRA are as follows (Li, 1967, p. 95):

1. Each array of y of the population follows the normal distribution.
2. The regression of y on x_1, x_2 . . . , x_k is linear.
3. The variance of all arrays of y of the population are equal.
4. The samples are drawn at random.
5. The x-values remain constant for all samples and do not change from sample to sample.

Multiple regression analysis is used to measure and to test the significant net effect of the independent variables on the dependent variable, holding the effects of other independent variables in the equation constant. This unique contribution holds true only for those independent variables in the model. Any addition or subtraction of variables to this model would result in a redistribution of the explainable variance among the new set of independent variables.

The F-distribution was utilized to test the significance of the overall multiple R with k and N-k-1 degrees of freedom. The alpha level of .05 was used to test the chance occurrence of the multiple R. This procedure results in a test of the general null hypothesis that all k partial regression coefficients are equal to zero.

The usefulness of multiple regression analysis methodology has been demonstrated by various investigators. Impellitteri and others (1969b), Kapes (1971) and Enderlein (1972) have utilized this statistic in career development research.

Hallberg (1969) has written the computer program selected for this analysis. The program, Statistical Analysis of Single Equation Stochastic Models Using the Digital Computer, is available under the title of QSASE at The Pennsylvania State University Computation Center.

Multiple regression analysis is the underlying mathematical framework for path analysis. Path analysis, like correlation, cannot prove causation. However, path analysis presents the researcher with a technique whereby the direct and indirect effects of certain variables on certain other variables might be estimated according to a causal model.

A model will be presented in Figure 3 as an example to aid in the description of path analysis methodology.

Variables X_1 and X_2 in the above model are exogenous, while variables X_3 and X_4 are endogenous. This is a recursive model, one in which all endogenous variables are determined by previous variables and the flow is in one direction with no reciprocal links. The exogenous variables are assumed to have no antecedent variables and a zero-order correlation is used to denote their relationship to each other.

When examining the effects X_1 and X_2 have upon x_3, the relationship is expressed by path coefficients. A path coefficient is a standardized regression coefficient, or Beta Weight, thereby permitting comparisons between path coefficients. The magnitude of the path coefficient is an estimate of what one standard deviation change in the independent variable would cause in the dependent variable. As the value of the path

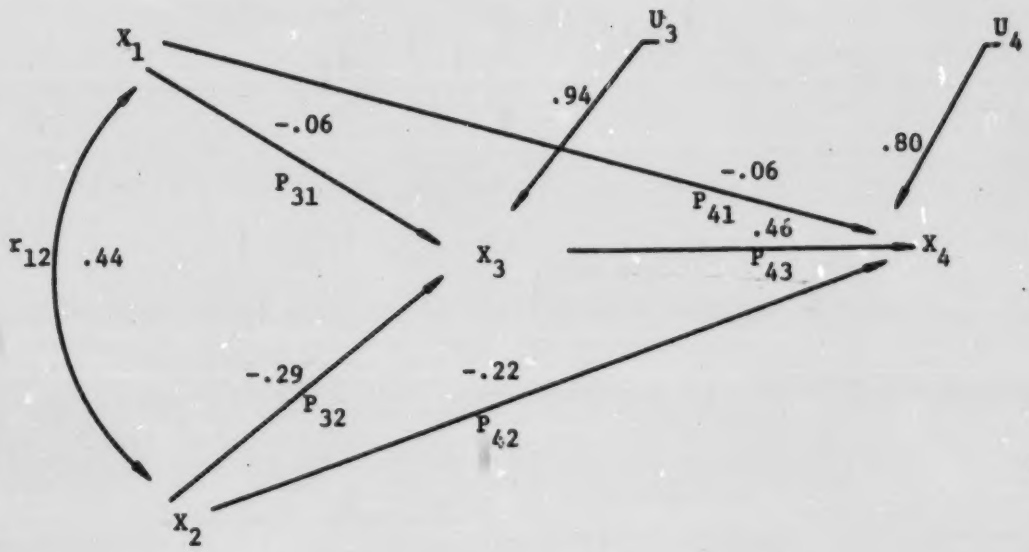

Figure 3. Example Model.

X_1 = Vocational Maturity - Ninth Grade
X_2 = IQ as Measured by GATB-G - Ninth Grade
X_3 = Occupational Aspiration - Tenth Grade
X_4 = Occupational Aspiration - Twelfth Grade

(The above model was previously unpublished and was developed at The Pennsylvania State University by Enderlein, Kapes, O'Reilly and Warland, 1972).

coefficient increases the predictive strength of that variable increases. The residual, computed by the square root of one minus the multiple correlation squared, $\sqrt{1-R^2}$, represents the proportion of the standard deviation of the endogenous variable which is attributed to all unmeasured variables outside the original set of exogenous variables. The residuals in Figure 3 are represented by U3 and U4.

Statistical significance of a path coefficient is tested using the rule, does the magnitude of the path coefficient exceed twice its standard error; if so, then this path is further analyzed in the findings section. A causal model is said to be fully identified only when each dependent variable is related to each independent variable.

Land (1971) offers the following general form for the Path Theorem.

$$r_{ij} = \Sigma_k P_{ik} r_{kj}$$

Where: r = correlation coefficient

p = path coefficient

i = number of the dependent variable

j = number of the independent variable

k = index of all numbers between j and i, including j, (p. 26).

This theorem is used to test the adequacy of the causal model. The relationship between the exogenous variables, X_1 and X_2, is equal to their zero-order correlation coefficient. The direct effect of X_1 upon X_3 is expressed as the path coefficient P_{31}, and is computed at the same time P_{32} is computed using multiple regression analysis.

Charner and Cohen (1973) suggest an alternative method for the calculation of the total effect. They suggest the following:

Total Causal Effect = Direct Effect + Indirect Causal Effect,

(p. 7)

The change in this method is in the Indirect Causal Effect term. They suggest that the term indirect effect, both causal and noncausal, implies the presence of an intervening variable which the independent variable affects and which, in turn, affects the dependent variable.

In addition, this method suggests that the total causal effect is not equal to the correlation between the two variables, as was the case in the past. This is due to the presence of other variables which take up a component of the correlation.

Thus the computation of the indirect effect of one variable upon another through an intervening variable is possible. The indirect routes must be sensible and conform to the ordering of the causal model. That is, the flow should be in one direction in a recursive model.

With reference to the data presented in Figure 3, the total effect between X_2 and X_4 will be computed.

$$r_{24} = P_{42} + P_{43} P_{32}$$

$$-.396 = -.220 + (.46)(-.29)$$

$$-.396 = -.220 + (-.1334)$$

$$-.396 = -.353 + \text{"spurious effect"}$$

Note that the direct effect plus the indirect effect is not equal to the correlation coefficient r_{24}, the total effect. The criterion for an indirect effect to be present is that the indirect cause must operate through an intervening variable. Thus the criteria is met in that X_3 is the intervening variable between X_2 and X_4. The correlation coefficient may now be referred to as the sum of, (a) the direct effect, (b) the

indirect causal effect, and (c) the remaining spurious effect due to the correlation accounted for by the association of all other predetermined variables.

The method used to compute indirect effects is to state the correlation between the variables in terms of path coefficients using the Path Theorem. In addition, apply the Path Theorem to all remaining correlations. After subtracting out the direct effect term, sum all terms which do not contain a correlation coefficient. This summed quantity represents components of the indirect causal effect. Thus an indirect effect implies causal linkage between variables, that is, the effect must act through an intervening variable.

The total effect, r_{24}, is equal to the direct effect of X_2 upon X_4, expressed as P_{42}, plus the summation of a possible variable antecedent to X_4. The indirect effect, computed to be -.1334, was smaller than the direct effect indicating that the variable X_2 determines X_4 in a direct rather than an indirect manner. If the indirect effect were found to be larger than the direct effect, this would indicate that the intervening variable plays an important role in terms of the total effect between the two variables in question.

Whenever the total variance of the endogenous variable is not entirely explainable by the antecedent variables in the model, the remainder is computed in the form of a residual.

The following computational formula from Land (1971) will be used to demonstrate the computation of the residual for the variable X_3.

$$P^2_{3U3} = 1 - (P_{31}\, r_{31}) + (P_{32}\, r_{32})$$

$$P^2_{3U3} = 1 - \underset{(.0132)}{(-.06)\ (-.22)} + \underset{(.0957)}{(-.29)\ (-.33)}$$

$$P^2_{3U3} = 1 - (.1089)$$

$$P^2_{3U3} = .8911$$

$$P_{3U3} = \sqrt{.8911}$$

$$P_{3U3} = .94$$

Estimates of the indirect effects and residual components of the causal model may be computed using these formulas. It must be pointed out that path analysis is primarily concerned with the total and direct effects between variables. The total effect expressed in terms of a correlation coefficient must be significant before direct and indirect effects become meaningful. Indirect effects are only computed when they are larger than the direct effect and for some theoretical consideration the indirect effect is of interest to the model. Indirect effects are usually small and do not receive major attention in the explanation of the model.

The model proposed in Figure 1 (p. 16) and investigated by this study utilized the following variables:

X_1 = Sex

X_2 = GATB "G" Score (Ninth Grade)

X_3 = GATB "M" Score (Ninth Grade)

X_4 = Value of Interest and Satisfaction (Ninth Grade)

X_5 = Value of Salary (Ninth Grade)

X_6 = Socioeconomic Status

X_7 = Curriculum (Tenth Grade)

X_8 = Grade Point Average (Ninth through Eleventh Grade)

X_9 = Vocational Maturity (Twelfth Grade)

X_{10} = Minnesota Satisfaction Questionnaire Score (One Year Post High School)

The residuals (that component not directly measured) are now shown in Figure 1, but a residual exists for each variable X_7 through X_{10}. These variables are:

X_{7u} = The residual associated with X_7

X_{8u} = The residual associated with X_8

X_{9u} = The residual associated with X_9

X_{10u} = The residual associated with X_{10}

The straight line relationship in Figure 1 represents a proposed theoretical relationship which will be included in the regression model. The analysis of the model will be restricted to only those relationships which demonstrate statistical significance when tested using the rule that a path coefficient should be at least two times its standard error. Correlations among exogenous variables (X_1 to X_6) in Figure 1 will be presented in matrix form along with all other variables (X_7 to X_{10}). Usual procedure dictates the use of curved lines with arrow heads at both ends to indicate all possible paired relationships between these variables. For obvious reasons, these lines were omitted. The correlations between these variables are useful in the analysis, however, no assumptions are made concerning their relationships.

IV

FINDINGS

Introduction

The findings of this investigation are reported as they pertain to the testing of the model for each of the three samples: the total sample, males and females; male sample; and the female sample. All statistical information is presented in table and figure form and is discussed in this chapter only to the extent necessary to interpret the causal model effects.

Although a large number of relationships exist for each of the three models, only those which are directly pertinent to this study will be discussed. Detailed discussion will be limited to those variables whose path coefficients are either greater than or equal to twice their standard error, thereby exhibiting statistical significance.

The Model

The first objective of this study was to develop a causal model which may be used to predict job satisfaction, using in-school and student characteristic variables. Before proceeding to the analysis of the causal model, several tables of descriptive statistics are presented to provide background information concerning the variables used in the development of the model. Figure 1 displays the causal model. Table 2 presents the means and standard deviations of the in-school and student characteristic variables used for each of the three samples tested. From Table 2, it can be seen that the means for the GATB variables are

Table 2: Means and Standard Deviations for All Variables in The Model for Each of The Three Samples: Total Sample (Males and Females), Male Sample, and Female Sample.

Variable No.	Variable Name	Total Sample (N = 208)		Male Sample (N = 89)		Female Sample (N = 119)	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	Sex	1.57	0.50	--		--	
2	GATB-G, Intelligence (Ninth Grade)	91.96	10.91	92.39	9.74	91.64	11.75
3	GATB-M, Manual Dexterity (Ninth Grade)	86.75	75.64	86.90	16.30	86.64	18.64
4	Value - Interest and Satisfaction (Ninth Grade)	19.16	4.81	17.98	4.97	20.04	4.51
5	Value - Salary (Ninth Grade)	12.74	7.06	14.43	6.57	11.48	7.17
6	Socioeconomic Status[a]	33.23	7.69	33.40	7.98	33.09	7.50
7	Curriculum (Tenth Grade)	1.49	0.50	1.35	0.48	1.59	0.49
8	Grade Point Average (Ninth Through Eleventh Grade	3.12	0.52	2.95	0.50	3.25	0.52
9	Vocational Development Inventory (Twelfth Grade)	35.46	6.57	34.25	7.09	36.29	6.06
10	Minnesota Satisfaction Questionnaire Total Score (One Year Post High School)	72.10	13.68	70.32	13.15	73.42	13.99

[a] This variable was coded and computed according to the formula on page 78.

usually less than 100 units and the standard deviations are less than 20 units which are the expected values for an adult population. However, the observed values are approximately normal for a sample of ninth graders. In addition, the GATB variables seem to be similar across the three samples.

The observed data for the two occupational values are consistent with the theoretical considerations which were included in the development of the model. The females scored higher on the Interest and Satisfaction value and males scored higher on the Salary value. The Socioeconomic variable was very similar across the three samples, indicating that the males and females came from similar family backgrounds. On the achievement variable, GPA, the females obtained a higher average than did the males. On the measure of vocational maturity (VDI) and the indicator of job satisfaction (MSQ) the females also scored higher than the males.

The degree of job satisfaction obtained by the three samples was: 70.32 for the males, 72.10 for the total sample, and 73.42 for the females. The females displayed the highest mean MSQ score, but it was somewhat lower than the mean MSQ score for the normative group composed of both males and females which was 74.85. However, it appears that the sample utilized in this study closely resembled the MSQ normative group.

The Efficiency of the Model For the Total Sample

The second purpose of this study was to test the efficiency and validity of the model in predicting job satisfaction using an appropriate sample of males and females. Zero-order correlations among all

variables in the model for the male and female sample are presented in Table 3. In Table 3 it can be seen that two of the variables under study correlate significantly at the .05 alpha level with the measure of job satisfaction, the MSQ. These two variables are: Value-Salary, and the measure of vocational maturity, VDI. In addition to significance, the direction of these two variables are in accordance with theoretical considerations of the model. That is, the correlation coefficient for the variable Salary is negative, whereas the correlation coefficient for the variable VDI is in the positive direction.

The full model with path coefficients and residuals is presented in Figure 4. Since all of these path coefficients are not significant, it was decided to identify those path coefficients which were significant with a heavier line so that the reader might more readily identify those paths. Thus, those paths with heavier lines are the ones whose path coefficients are significant for this sample. The first endogenous variable in the model was X7, Curriculum (Vocational, Non-vocational). From Table 3 it is seen that the only correlation coefficient significant with the Curriculum variable was the Sex variable, with a value of .237. The F-ratio for least squares regression analysis of the six exogenous variables and Curriculum was equal to 2.411 and was significant at the .05 alpha level. The residual for Curriculum was equal to .98, indicating that only a small portion of the variance of this variable, .039, was explained by the six exogenous variables. The Sex variable was the only exogenous variable whose beta coefficient was greater than twice its standard error. In addition, no intervening variable exists between those two variables; therefore, no indirect effects were computed for the Curriculum variable.

Table 3: Zero-order Correlations Among All Variables in The Model For The Total Sample, Males and Females (N = 208).

Variables	1	2	3	4	5	6	7	8	9
1. Sex									
2. GATB-G[a]	-.034								
3. GATB-M[a]	-.007	.260							
4. Value - Interest and Satisfaction[a]	.213	.144	-.037						
5. Value - Salary[a]	-.207	-.056	.119	-.468					
6. Socioeconomic Status[a]	-.020	.084	.051	.085	-.095				
7. Curriculum[b]	.237	- 018	.018	-.058	-.088	.088			
8. GPA[c]	.279	.432	.132	.242	-.247	.039	-.065		
9. VDI[d]	.147	.212	.035	.216	-.127	.037	-.054	.363	
10. MSQ[e]	.112	-.078	-.102	-.028	-.155	.032	.034	.069	.184

[a]Ninth Grade

[b]Tenth Grade, 1 = Vocational, 2 = Non-Vocational

[c]Ninth Through Eleventh Grade

[d]Twelfth Grade

[e]One Year Post High School

$r \geq .138$ Significant at .05 Level

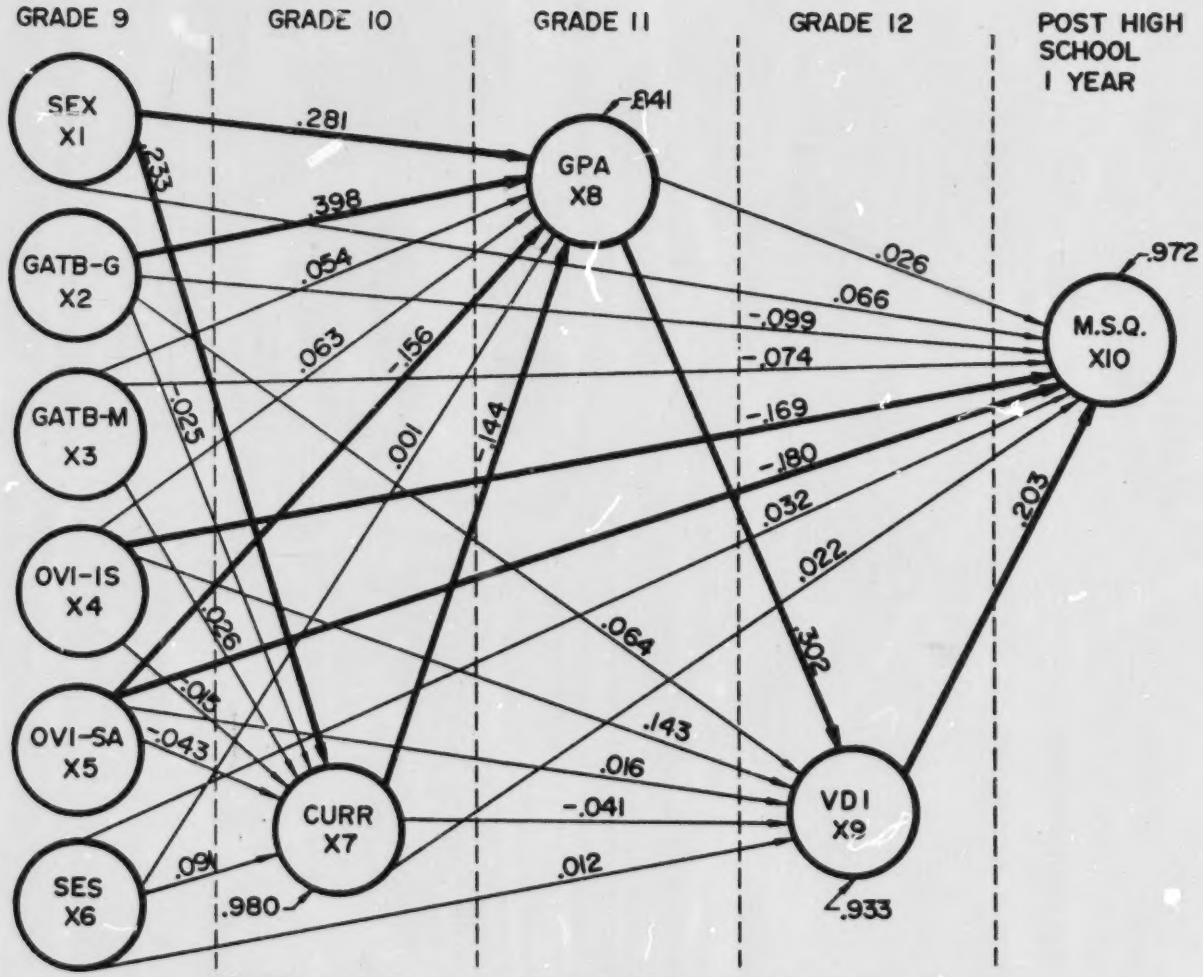

FIGURE 4. PATH COEFFICIENTS AND RESIDUALS OF THE MODEL FOR THE MALE AND FEMALE SAMPLE (N=208)

The next variable to be explained in the model was Grade Point Average. The zero order correlations presented in Table 3 indicate that four of the variables significantly correlate with Grade Point Average. These variables are: Sex, GATB-G, Value-Interest and Satisfaction, and Value-Salary. These correlations range from .279 for the Sex variable to -.247 for the Salary variable. The F-ratio calculated by this analysis was equal to 13.265 and was significant at the .05 alpha level. The ($\bar{R}^2$) corrected for degrees of freedom, also known as the coefficient of determination, was equal to .293. That is, approximately 29 percent of the variance of the variable, GPA, was accounted for by variables X_1 thru X_7 in the model. The significant variables were: Sex, GATB-G, Value-Salary, and Curriculum. There were no indirect effects found to be large enough to receive major consideration; therefore, none were reported. The residual for this particular endogenous variable, GPA, was equal to .84.

An indicator of vocational maturity, The Vocational Development Inventory, was the next variable to be considered in the model. This variable, X_9, was obtained at data collection time four, grade 12, for inclusion in the model. The zero order correlations between all exogenous variables, X_1 thru X_8, and with the variable VDI, are presented in Table 3. Those variables significantly correlated with the variable VDI include: Sex, GATB-G, Value-Interest and Satisfaction, and GPA. The range of the correlation coefficients for these variables is from .146 for Sex to .363 for VDI. The computed F-ratio was equal to 6.135 and was significant at the .05 alpha level. The $\bar{R}^2$ was equal to .129. Thus the amount of variance explained by this analysis was approximately 13 percent. The only variable in the analysis which significantly

predicted VDI was GPA. Since there was no intervening variable between GPA and VDI there could not be any indirect effect operating. Therefore, the largest component of the total effect of GPA upon VDI was made up in the direct effect term, the path coefficient. The residual for the VDI variable was equal to .93.

The final endogenous variable in the model was the criterion variable, The Minnesota Satisfaction Questionnaire. This variable was expected to be directly determined by all other variables in the model. Table 3 presents the zero order correlations among all variables for the entire model. On examination of Table 3 it can be seen that both the Salary variable and the variable VDI correlate significantly with the criterion variable, MSQ. The value of the correlation coefficient for these two variables was equal to -.155 for Salary and .184 for VDI. The F-ratio for this analysis was equal to 2.338 and was found to be significant at the .05 alpha level. The $\bar{R}^2$ was equal to .055. Thus, about 6 percent of the total variance of MSQ was explainable by this model. There were three path coefficients which were significantly different from zero. These variables were: Value-Interest and Satisfaction, Value-Salary, and VDI. From an examination of the zero order correlations in Table 3 and a comparison of those correlations with the path coefficients for those variables, no indirect effects for those variables seemed to be large enough to be considered important. That is, the largest component of the total effect upon MSQ was accounted for by the direct effect term, the path coefficient. The residual for the endogenous variable MSQ was equal to .97.

The Efficiency of the Model For the Male Sample

The third purpose of this study was to test the efficiency of the model in predicting job satisfaction for males only as compared to females only. This section will be concerned with the analysis of the model for the sample of males. Table 4 presents the zero order correlations among all variables for the male sample. Figure 5 displays all path coefficients and residual variables in the model. From Table 4 it can be seen that none of the variables in the model correlate significantly with the first endogenous variable, Curriculum (Vocational, Non-vocational). The regression analysis of the six exogenous variables upon Curriculum was conducted. An F-ratio equal to 1.586 was calculated and found to be non-significant at the .05 alpha level. Therefore, the null hypothesis, all path coefficients are equal to zero, was retained and no further analysis was conducted.

The next variable to be analyzed was Grade Point Average. From the correlation matrix in Table 4 it can be seen that the only variable which correlated significantly with GPA was GATB-G. The F-ratio calculated from regression analysis was equal to 4.645 and was found to be significant at the .05 alpha level. The $\bar{R}^2$ was equal to .199. Thus, approximately 20 percent of the GPA variable was accounted for by this combination of variables. The residual for GPA was found to be equal to .895. Once again heavier path lines were used to indicate significant path coefficients related to this variable. From examination of Figure 5 it can be seen that the two variables whose path coefficients are significant are: GATB-G, and Curriculum. The largest portion of

Table 4: Zero-order Correlations Among All Variables in The Model For The Male Sample (N = 89).

Variables	2	3	4	5	6	7	8	9
2. GATB-G[a]								
3. GATB-M[a]	.166							
4. Value - Interest and Satisfaction[a]	.016	-.109						
5. Value - Salary[a]	-.007	.096	-.451					
6. Socioeconomic Status[a]	.080	.049	.097	-.136				
7. Curriculum[b]	.187	.131	.065	-.134	.183			
8. GPA[c]	.399	.199	.088	-.079	-.028	-.139		
9. VDI[d]	.086	-.104	.248	-.115	.059	-.069	.291	
10. MSQ[e]	-.173	-.023	-.005	.019	.086	-.090	-.067	.175

[a]Ninth Grade

[b]Tenth Grade, 1 = Vocational, 2 = Non-vocational

[c]Ninth Through Eleventh Grade

[d]Twelfth Grade

[e]One Year Post High School

$r \geq .211$ Significant at .05 Level

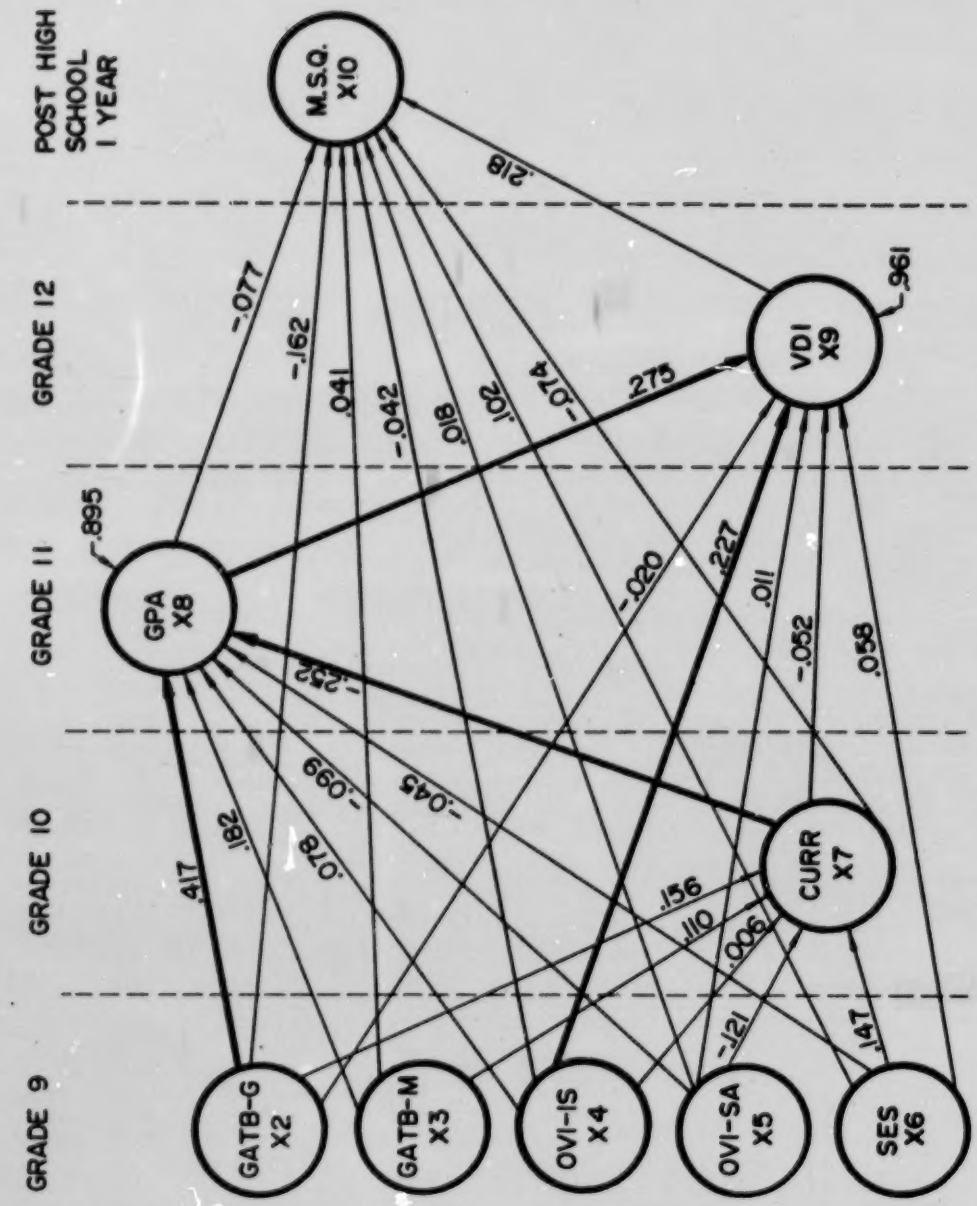

FIGURE 5. PATH COEFFICIENTS AND RESIDUALS OF THE MODEL FOR THE MALE SAMPLE (N= 89)

the total effect these predictor variables have upon the endogenous variable, GPA, is accounted for in the direct effect component, the path coefficient. Therefore, no indirect effects were computed.

The next variable considered in the model was the indicator of vocational maturity, The Vocational Development Inventory. From Table 4 it can be seen that two of the variables in the model correlate significantly with the variable, VDI.

These variables are: Value-Interest and Satisfaction, and Grade Point Average, with values of .248 and .291 respectively. The regression analysis F-ratio was equal to 2.236 and was found to be significant at the .05 alpha level. The $\overline{R}^2$ was equal to .077. Thus, this combination of variables accounted for approximately 8 percent of the variance of the variable, VDI. The two variables whose path coefficients were found to be significant were: Value-Interest and Satisfaction, and GPA, with path coefficient values of .227 and .275 respectively. Figure 5 displays these variables and heavier lines assist the reader in identification of those paths within the model. Since the path coefficients are close in magnitude to the correlation coefficients, no indirect effects were computed. That is, the major component of the total effect was accounted for in the direct effect term, the path coefficient. The residual variable for the variable, VDI, was equal to .961.

The final variable considered in this model was the criterion variable, MSQ. The zero-order correlation between each of the variables and the criterion are reported in Table 4. An inspection of this table reveals that none of the variables correlate significantly with the criterion, MSQ.

In order to examine the amount of unique information available from the eight exogenous variables in predicting the endogenous variable, MSQ, a Multiple Regression Analysis was conducted. The overall F-ratio was calculated to test the null hypothesis that all path coefficients were equal to zero. The F-ratio was found to be equal to 0.9486 and was found to be non-significant at the .05 level; thus the null hypothesis was retained and no further analysis was conducted.

The Efficiency of the Model For the Female Sample

This section of the study was devoted to testing the efficiency of the model for the female component of the sample. The zero-order correlations among all variables for the female sample is presented in Table 5. The path coefficients and residuals of the model are displayed in Figure 6.

The first endogenous variable considered was Curriculum (Vocational and Non-vocational). An inspection of Table 5 reveals that none of the exogenous variables correlate significantly with the variable, Curriculum. In order to examine the relationship of those variables to the Curriculum variable, a MRA was computed. The calculated overall F-ratio was found to be equal to 0.4209 and was not significant at the .05 alpha level. Therefore, the null hypothesis was retained and no further analysis was conducted.

The next variable used as an endogenous variable was GPA. Table 5 displays the zero-order correlations among all variables. It can be seen in Table 5 that three variables correlate significantly with GPA: GATB-G, Value-Interest and Satisfaction, and Value-Salary. The value

Table 5: Zero-order Correlations Among All Variables in The Model For The Female Sample (N = 119).

Variables	2	3	4	5	6	7	8	9
2. GATB-G[a]								
3. GATB-M[a]	.311							
4. Value - Interest and Satisfaction[a]	.251	.015						
5. Value - Salary[a]	-.098	.134	-.441					
6. Socioeconomic Status	.087	.052	.087	-.076				
7. Curriculum[b]	-.128	-.049	-.038	.020	.029			
8. GPA[c]	.484	.102	.281	-.282	.104	-.142		
9. VDI[d]	.321	.145	.137	-.089	.022	-.112	.381	
10. MSQ[e]	-.017	-.151	-.092	-.235	-.004	.074	.112	.169

[a] Ninth Grade

[b] Tenth Grade, 1 = Vocational, 2 = Non-vocational

[c] Ninth Through Eleventh Grade

[e] Twelfth Grade

[e] One Year Post High School

$r \geq .195$ Significant at .05 Level

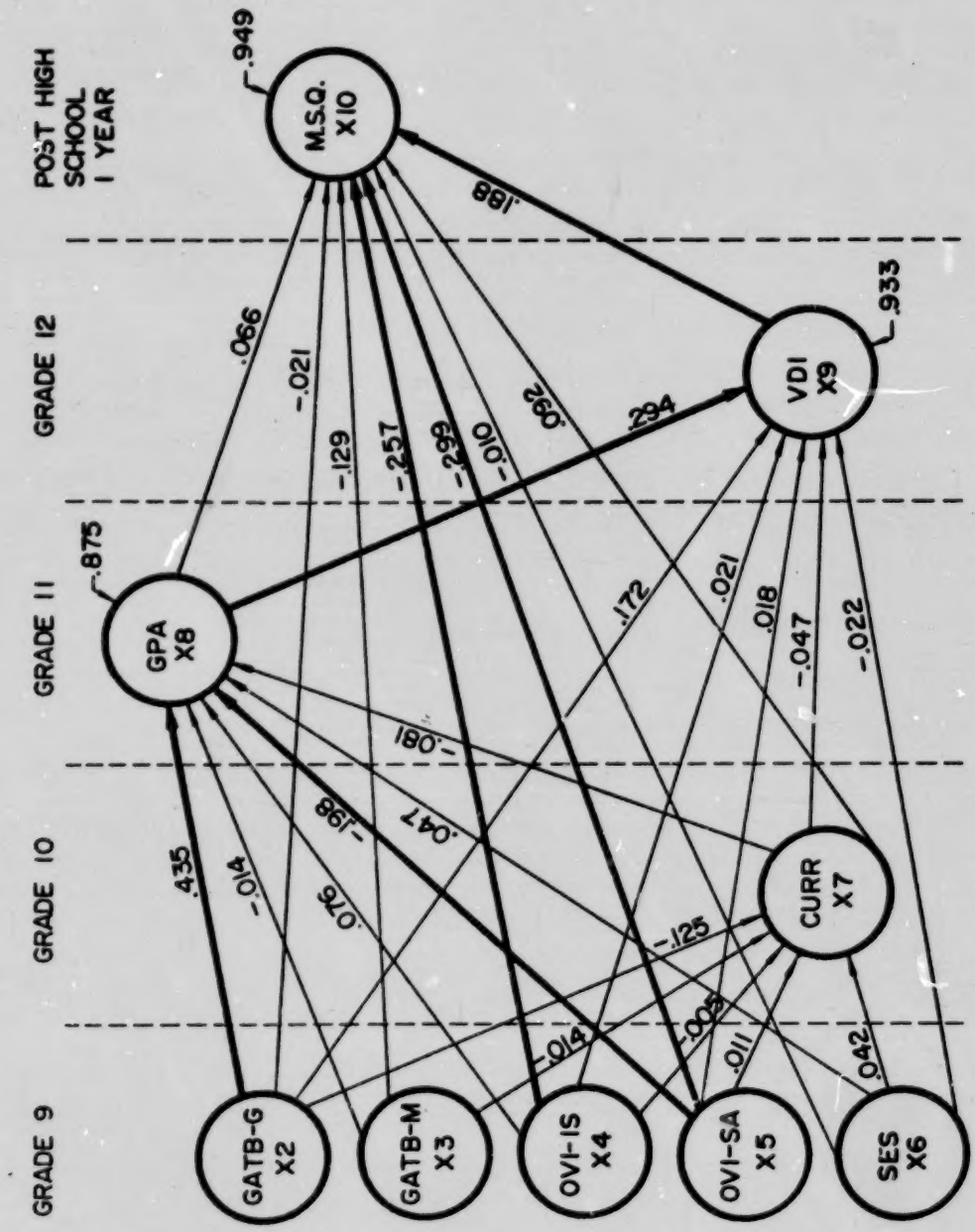

FIGURE 6. PATH COEFFICIENTS AND RESIDUALS OF THE MODEL FOR THE FEMALE SAMPLE (N=119)

of the GATB-G correlation coefficient was equal to .484. It is interesting to note that the correlation coefficients for the two variables were approximately the same in magnitude however, in opposite directions, which supports theoretical construction of the value instrument. The correlation between Value-Interest and Satisfaction, and GPA was equal to .281 and the correlation between Value-Salary and GPA was equal to -.282.

The F-ratio calculated to test the null hypothesis that the path coefficients were equal to zero was found to be equal to 8.1058 and was significant at the .05 level. The $\overline{R}^2$ was equal to .265. Thus, the combination of these seven variables accounted for approximately 27 percent of the variance in the variable, GPA. Two variables were found to have significant path coefficients of .435 and -.198 respectively. Figure 6 displays the model with the path coefficients and residuals. Once again, heavier lines assist the reader in identifying significant paths throughout the model. A comparison of path coefficients and the correlation coefficients associated with them reveals that the majority of the total effect was accounted for by the direct effect term, the path coefficient. Thus, no indirect effects were computed for the GPA variable. The residual for the GPA variable was computed and found to be equal to .875.

An indicator of vocational maturity, VDI, was the next endogenous variable considered in the analysis. The zero-order correlations between the eight independent variables and the endogenous variable, VDI are presented in Table 5. It can be seen that two independent variables correlate significantly with the variable VDI. They are: GATB-G and GPA, with values of .321 and .381 respectively.

The F-ratio computed to test the significance of the overall model was equal to 3.9078, which was significant at the .05 level. The $\overline{R}^2$ was equal to .128. Thus, this combination of variables accounted for approximately 13 percent of the variance of the variable, VDI. In Figure 6 it can be seen from the heavier line that the only variable to display a significant path coefficient with the variable, VDI, was GPA. The value of this path coefficient was .294. Since there were no variables between GPA and VDI there could not be an indirect effect between these two variables. Therefore, the total association between these two variables was primarily due to the direct effect term, the path coefficient. The residual for the variable VDI was computed and found to be equal to .933.

The final variable considered was the criterion variable, MSQ. All eight independent variables in the model were included in the Multiple Regression Analysis. The F-ratio calculated was equal to 2.6167 and found to be significant at the .05 alpha level. The zero-order correlations between all eight variables and the criterion MSQ are presented in Table 5. From this table it can be seen that only one variable, Value-Salary, correlated significantly with the criterion variable, MSQ. The value of this correlation was found to be equal to -.235.

The $\overline{R}^2$ was equal to .098. Therefore, this particular combination of variables accounted for approximately 10 percent of the total variance of the variable MSQ. The residual for the variable, MSQ, was calculated and found to be equal to .94.

From observing the heavier lines in Figure 6 it can be seen that three of the eight independent variables display path coefficients which are significant. These variables are: Value-Interest and Satisfaction,

Value-Salary, and VDI. Although intervening variables exist between two of these variables, Value-Interest and Satisfaction, and Value-Salary, and the criterion MSQ, the indirect effect term was not found to be larger than the direct effect component of the total effect and therefore, was not reported. The largest part of the total effect was accounted for by the direct effect term, the path coefficient.

Table 6 presents the $\overline{R}^2$ coefficients for each endogenous variable in the model for each of the three samples used in the study. The $\overline{R}^2$ coefficients presented in Table 6 indicate the portion of the explainable variance for each endogenous variable. This table was provided to assist the reader in making comparisons of the $\overline{R}^2$ coefficients across each of the three samples.

Summary

A comparison of the three samples--the total sample, male sample, and female sample--indicates that job satisfaction was the most predictable for the females with an adjusted R^2 equal to .098. The total sample was next with an adjusted R^2 equal to .055, and the male sample was not found to be predictable from the combinations of variables used in this model.

Although only a small portion of the total variance of the criterion variable MSQ, was predictable using this model and samples, the findings indicate that a portion of this variable was predictable. In addition, those variables which were most useful in the prediction process were found to be variables associated with the affective domain. That is, in both samples where prediction was possible, the total sample (males and females) and the female sample, the same three variables were

Table 6: $\overline{R}^2$ Coefficients for Each Endogenous Variable in The Model for Each of the Three Samples: Total Sample (Males and Females), Male Sample, and Female Sample.

Variable Number	Variable Name	Total Sample (N = 208) $\overline{R}^2$	Male Sample (N = 89) $\overline{R}^2$	Female Sample (N = 119) $\overline{R}^2$
7	Curriculum (Tenth Grade)	.039	*	*
8	Grade Point Average (Ninth Through Eleventh Grade)	.293	.199	.265
9	Vocational Development Inventory (Twelfth Grade)	.129	.077	.128
10	Minnesota Satisfaction Questionnaire - Total Score (One Year Post High School)	.055	*	.098

NOTE: *Indicates the computed F-ratio was found to be non-significant; therefore, $\overline{R}^2$ was not calculated.

found to be significant. These variables were: Value-Interest and Satisfaction, Value-Salary, and VDI, all of which are associated with the affective domain. The degree of satisfaction displayed by the females was higher than that of the other two samples but somewhat lower than the mean of the normative group, for the MSQ. However, it appears that the sample utilized in this study closely resembled the MSQ normative group.

V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of this study, as well as conclusions and recommendations based upon the findings of the study.

Summary

Introduction

The wealth of any nation is based upon its ability effectively to educate and utilize its human resources. As compared to natural resources, human resources may be described as the catalysts which transform an idea from an abstract concept into goods and services. Thus, human resources development is the people-oriented approach to the development of the nation's resources.

The problems associated with the development of human resources generally fall into two categories: underemployment and underdevelopment. An individual who is underemployed is usually employed, but at a level below his capabilities. Underdevelopment, on the other hand, refers to the posture of a country whose human resources are not developed to their fullest potential. Thus in order for a country to progress and achieve a high standard of living, its manpower must be developed to a level equal to the capabilities of its citizens.

Historically, the United States has pursued only two human resource macro-policies. One is immigration, the second is public supported education. The national manpower supply/demand ratio was regulated through use of the first policy, immigration. That policy placed little

emphasis upon education and, for the most part, concentrated upon the training of workers to fill specific jobs. Global human capabilities (e.g., reasoning) must be developed through education, while training should be reserved for specific tasks (e.g., repairing a specific element after its difficulties have been identified).

The second policy, public supported education, provides the financial resource for the most widely used vehicle in the development of human resources, formal education. Formal education is perhaps the most common and effective method for the development of skills, knowledges and capabilities of individuals, who represent this or any nation's human resources.

The increase of public support for education demonstrates this nation's commitment to the educational development of its citizens. The overriding rationale for this support is the concern of manpower planners for eliminating the waste or under-utilization of our human resources in terms of skills and abilities.

Vocational education has continuously enjoyed federal support for its programs since President Lincoln signed the Morrill Land Act in 1862. That act demonstrated the nation's first attempt to promote education and training for employment. However, that act did not provide funds for education and training at a level less than college. Therefore, as a result of the increased growth in the economy and the lack of trained manpower from abroad, it became evident that additional programs were needed beyond high school, but less than college, to fill this void. Efforts by the industrial and educational community resulted in the Vocational Education Amendments of 1968. In addition to making the 1963 Vocational Education Act more flexible, the 1968 amendments

emphasized programs which were designed to respond to the needs of people, so that education and training would be available to any individual who might profit from it.

These considerations have clear-cut implications for educational policy and curriculum decision making. Educational institutions are being called upon with increasing frequency to provide answers to the many and varied problems created by technological growth, especially those problems concerned with human resource development.

One of the outcomes of the socio-educational process should be the merging of all forces which act upon an individual so that the individual is able to deal effectively with the environment. Work is an integral part of an individual's environment. The ability of an individual to work consistently, and to receive satisfaction from this work, is necessary if society is to reduce wastage in terms of its human resources. Job or work satisfaction must become a concern for educators if society is to fully develop its human resources.

Since high school represents for some the last experience in a formal educational situation before entering into a lifetime of work, consideration must be given to in-school student characteristics and variables. It is with these variables that the school system is able to work in order to promote change.

The identification of in-school factors and their effect upon job satisfaction is related to the total growth potential of the individual and to the well-being of society.

Statement of the Problem

This study was part of a continuing longitudinal effort in vocational development research initiated in 1968 by members of the faculty and staff of the Department of Vocational Education at The Pennsylvania State University under the title Vocational Development Study (VDS). The study was conducted at a unique point in time--unique in that vocational education research is witnessing a merging of the needed longitudinal data and the sophisticated methodology required for the analyses of such time series data. Super (1969) identified Lattice Theory, Markov Chain Theory, and Path Analysis as possible useful methodologies in developing career models. This study used the Path Analysis technique. Path analysis is a methodology relatively new to the field of vocational education research, and it provides a different statistical tool for answering some of the complex questions of vocational behavior.

This study was considered as an initial effort to develop and evaluate a linear recursive path model using in-school student characteristics in relationship to the criterion variable, job satisfaction, as measured by The Minnesota Satisfaction Questionnaire.

The model which was developed was based on longitudinal data collected over five points in time: ninth, tenth, eleventh, and twelfth grades, and one year after graduation. The independent variables to be utilized in the model were chosen from the three psychological domains: cognitive, affective and psychomotor. In addition, measures of socioeconomic status, curriculum choice and achievement were used. These variables were chosen on an a priori basis using theoretical considerations and the results of previously conducted pilot studies. Figure 1

(p. 16) indicates the model which was evaluated in an attempt to uncover paths, both direct and indirect, which related job satisfaction to in-school student characteristics.

Specifically, the purpose of this study was to:

1. Develop a theoretical model for predicting employment satisfaction one year after graduation, using ninth to twelfth grade in-school variables based upon a review of previous research and pilot studies.
2. Evaluate the validity and usefulness of the model, using a representative sample of both males and females.
3. Test the efficiency of the model in predicting job satisfaction for males only as compared to females only.

Procedures

The sample used in this study consisted of 89 males and 119 females from the Altoona, Pennsylvania, secondary school system. If an individual was included in the sample, complete data exist for all five points in time used in the model. The data for this study were collected over a period of several years.

The statistical methodology used in this study was Path Analysis, along with Pearson Product Moment Correlation and Multiple Regression Analysis. Path Analysis is a technique for examining interrelated variables in a causal model for which exogenous variables can be assumed to determine endogenous variables. Multiple Regression Analysis is the underlying mathematical framework for Path Analysis. Pearson Product-Moment Correlations were used to test the relationships among all variables in the model.

A total of 10 student characteristic variables, including the criterion variable, Job Satisfaction, were used in the model. The model was evaluated in an attempt to uncover paths, both direct and indirect, which related job satisfaction to in-school student characteristics variables.

Findings

The causal model was evaluated for each of three samples: the male and female total sample, the male sample, and the female sample.

Path Analysis was used to determine the direct and indirect effects of certain variables on certain other variables according to a causal model. There were four variables in the model which were considered endogenous variables. These variables were: Curriculum (Vocational, Non-vocational), Grade Point Average, Vocational Development Inventory and The Minnesota Satisfaction Questionnaire.

Table 6 (p. 111) provides a summary of the $\overline{R}^2$ coefficients for each endogenous variable in each of the three samples. From Table 6 it can be seen that the exogenous variables in the total sample, males and females, accounted for approximately 4 percent of the variance of the Curriculum variable. The least squares regression analysis using the Curriculum variable as the criterion was found to yield an F-ratio which was non-significant for the other two samples, male only and female only.

The variable GPA was found to be the most predictable of all variables. The combination of variables for the total sample accounted for approximately 20 percent of the variance in the GPA variable. The variables in the female sample accounted for approximately 27 percent of

the variance of GPA, whereas the same combination of variables accounted for approximately 20 percent of the variance of the variable GPA in the male sample.

It was found that the variable VDI was also predictable by the particular combination of variables within each of the three samples. There did not seem to be any difference in the amount of predictions for the total sample and the female sample, with values of .129 and .128 respectively. The male sample displayed the smallest $\overline{R}^2$ coefficient with a value of .077.

The amount of explainable variance, $\overline{R}^2$, of the criterion variable MSQ was largest for the combination of variables in the female sample with a coefficient value equal to .098. This sample accounted for approximately twice as much variance of the variable MSQ as did the same variables in the total sample, which had an $\overline{R}^2$ equal to .055. The F-ratio for the male sample was found to be non-significant; therefore, $\overline{R}^2$ was not calculated.

In summary, job satisfaction for the female sample was twice as predictable as it was for the combined male and female sample, and it was not at all predictable for the male sample used in this study.

The females displayed a higher degree of job satisfaction than did the other two samples but somewhat less than the mean MSQ score of the normative group. Although the means for all three samples used in this study were less than the mean for the total normative group, it appears they were close enough to be considered representative of the normative group.

Conclusions

The conclusions based upon the findings of this study will be offered in the form of a discussion of each of the four endogenous variables in the model across the three samples: the total sample, males and females; the male sample; and the female sample.

The Efficiency of the Model

The major purpose of this study was to develop a theoretical model for predicting employment satisfaction one year after graduation, using ninth to twelfth grade in-school variables based upon a review of previous research and pilot studies.

An examination of Figures 4, 5, and 6 indicates that most variables chosen for this model were useful in predicting at least one of the four endogenous variables, and this combination of variables seems to be related throughout the model. However, not all variables were significantly related to the criterion variable Job Satisfaction. The variables not related to any of the endogenous variables were: GATB-M and Socioeconomic Status. This lack of relationship indicates that possession of a high versus a low degree of manual dexterity or membership in a family which operates in a high versus a lower socioeconomic milieu does not seem to influence curriculum choice, grade point average, vocational maturity or satisfaction on the job. Results of the analysis seem to indicate that the addition of these two variables had little or no effect on the total variance of the model. For the most part, the variables included in the path model were consistent.

Curriculum. The first endogenous variable to be considered in the model was Curriculum (Vocational, Non-vocational). The only exogenous variable which significantly related to Curriculum was the Sex variable within the total sample. The path coefficient was positive, indicating that the females were more likely to choose the non-vocational curriculum. The composition of the sample indicates that the vocational curriculum was made up of approximately equal numbers of males and females and the non-vocational curriculum consisted primarily of females. Thus, membership in either the male or female group would seem to be sufficient information for predicting curriculum choice in this sample. None of the other exogenous variables exhibited path coefficients large enough to be statistically significant for any of the three samples. This finding was not expected since the exogenous variables were similar to those used by counselors when counseling students as to the choice of a curriculum. Therefore, the Curriculum variable does not appear to be predictable to any great extent by the combination of exogenous variables used in this study except for Sex.

Grade Point Average. Grade Point Average was the second endogenous variable to be considered in the model. This variable was best predicted by the combination of variables in the total sample. The female sample was the next best for prediction of GPA, and GPA for the male sample was the least predictable. GPA displayed the largest amount of explainable variance of the four endogenous variables. But this is what would have been expected since the analysis consisted of predicting an in-school measure of academic success from a combination of variables associated with the school environment. The particular combination of

variables which significantly predict GPA was different for the three samples, although they were drawn from the same four variables. These variables were: Sex, GATB-G, OVI-Salary and Curriculum.

GPA was the most predictable in the total sample. A positive relationship existed between the GATB-G score, Sex and GPA in the total sample. In addition, a negative relationship was found between Occupational Value "Salary," Curriculum and GPA in the total sample. The direction of the path coefficient for the value variable Salary was consistent with the theoretical considerations of the model in that the lower the importance an individual places upon the value Salary, the higher the GPA. This finding seems to indicate that an individual who does not value salary highly at this point in time is likely to realize the value of an extended educational experience.

It was interesting to note that a negative relationship existed between Curriculum and GPA. That is, those students who were in the vocational curriculum were more likely to have a higher GPA than those in a non-vocational curriculum. This phenomenona is probably due to the fact that those in the non-vocational curriculum who possessed a high GPA were more likely to go on to college as opposed to entering a labor force. In addition, the females who were included in the vocational curriculum were likely to have a higher GPA than those in the non-vocational curriculum. This is likely to occur since those females with a high GPA enrolled in the non-vocational curriculum were likely to go on to some form of post-secondary education, thus restricting the range of females in terms of GPA in the non-vocational curriculum.

The variable GPA was next best predicted by the female sample. However, the number of significant variables decreased to two, GATB-G

and Value-Salary. Sex was not considered in this analysis since the sample was composed entirely of females and this variable was a constant.

Once again the GATB-G variable was related to GPA in the positive direction and OVI-Salary was related in the negative direction. The path coefficients for these two variables were somewhat higher than those in the total sample. However, that should be expected since one variable, Sex, was eliminated from the analysis.

GPA was least predictable for the male sample, when compared with the other two samples. Although the male sample was the least predictable, the combination of the predictor variables in the analysis accounted for approximately 20 percent of the variance of this variable. The two variables which were significantly related to GPA for the male sample were: GATB-G and Curriculum. The path coefficient for the variable GATB-G was once again in the positive direction, but somewhat smaller than the female sample although larger than the total sample. The path coefficient for the Curriculum variable was negative, favoring vocational students, and larger than the path coefficient for the total sample.

An analysis of the three samples seems to indicate that the variable GPA was best accounted for by group membership in both the female Sex and the vocational curriculum, by higher general intelligence, and by a low priority for salary gratification.

Vocational Development Inventory. The Vocational Development Inventory was the third endogenous variable to be analyzed in the model. The variables which significantly predicted VDI across the three samples were: GPA and OVI-Salary. The variable GPA displayed a significant

path coefficient related to VDI for all three samples. The magnitude of the path coefficients for the GPA variable was approximately the same for all three samples thus indicating that GPA had an almost constant effect upon the variable VDI and that achievement accounted for a large component of the vocational maturity variable. That is, the more academically successful an individual, the more likely he was to be aware of the work environment in a realistic way, thereby displaying a greater amount of vocational maturity.

The variable OVI-Interest and Satisfaction was the only other variable which was significantly related to VDI. OVI-Interest and Satisfaction, in combination with GPA, was related to VDI in the male sample only. The path coefficient for the variable OVI-IS was positive, indicating that the more value an individual places upon interesting work the higher would be his vocational maturity score. Although two variables, GPA and OVI-Interest and Satisfaction displayed significant path coefficients in the male sample, the combination of these two variables accounted for less variance in the VDI variable for the male sample than did GPA alone for the other two samples; total sample and females only. This finding implies that some overlap must exist between these two variables, GPA and OVI-IS, in predicting vocational maturity.

The Minnesota Satisfaction Questionnaire. The Minnesota Satisfaction Questionnaire was the criterion variable which was considered in the analysis of the model. The MSQ was not predictable by the combination of variables in the model for the male sample. However, the MSQ was predictable to some extent by the model using the total

sample of males and females, and the female sample. Of these two, the female sample was twice as predictable as the total sample and was therefore largely responsible for the amount of prediction in the total samples.

Of all the independent variables used in the model, three were found to have path coefficients which were significantly related to the criterion variable, MSQ. These variables were: OVI-Interest and Satisfaction, OVI-Salary, and VDI. These variables were identical for both samples in which job satisfaction was predictable. The magnitude of the two occupational value variables in the female sample was about one-third larger than those in the total sample, while the VDI coefficient was somewhat smaller. The direction of the path coefficient for the VDI variable was positive for both samples indicating that the greater amount of vocational maturity one possesses, the more likely one is to be satisfied on the job. This implies that to be satisfied in the work environment an individual should have as much realistic knowledge as possible about the work environment in respect to one's own needs.

The variable OVI-Interest and Satisfaction had a path coefficient which was negative in both samples. This finding was not consistent with the literature, which indicated that the greater the value one places on the interesting aspects of the job, the more likely one is to be satisfied with the occupation. Perhaps this aspect of the work environment has been stressed to a greater extent than what is actually necessary to achieve employment satisfaction or is simply less true among younger workers who have just entered the labor market.

The occupational value OVI-Salary displayed a negative path coefficient which was consistent with the theoretical make-up of the variable.

Once again, the value placed upon large amounts of salary to be derived from the job has been played down and replaced by other aspects of the work environment which point to job satisfaction. That is, if one places a low value on salary, one would be more likely to draw more satisfaction from the work environment than if salary was valued highly. It is possible that many of these jobs are low paying and, therefore, those who value salary tend to be dissatisfied.

The criterion variable MSQ was twice as predictable by the combination of independent variables in the model for the female sample as it was for the total sample. One explanation for this difference is that perhaps the school offers programs of interest to females in which the training is more easily transfered to the world of work and does not require additional on-the-job training as do many of the courses which males enter. The programs females enter, such as business and nursing, offer the opportunity to experience on-the-job situations more often than do the programs males enter. It is in this realistic training situation that females are able to make decisions regarding the appropriateness of their occupational choice. Occupational programs available to females closely resemble the actual job situation. This factor, coupled with limited opportunities for advancement, produces little conflict between their employment expectations and the support given to them by the job. On the other hand, males are often enrolled in courses where simulation of the actual work environment is difficult. Upon completion of the program, they often find that the occupations do not meet their expectations and experience dissonance which often leads to job

dissatisfaction. Also, perhaps females are more easily satisfied, or having lower salary values would tend to be less dissatisfied with low salaries.

Perhaps one of the important findings of this study was that certain variables were not related to job satisfaction. Socioeconomic status, Curriculum, GPA, GATB-G, and GATB-M were the independent variables in the model not related to job satisfaction.

The independent variables Socioeconomic status and GATB-M were not found to be related to job satisfaction or to any other endogenous variable. That is, family background and manual dexterity appear to have little relationship to job satisfaction. GATB-G was found to be related to GPA but to no other variable, indicating that school achievement is a function of intelligence as would have been expected. Curriculum (Vocational, Non-vocational), was related to GPA, but it was not related to any other variable. Thus, those who entered a vocational curriculum did no better in terms of job satisfaction than those in the non-vocational curriculum, while they might have been expected to since they were specifically prepared to enter the world of work after graduation.

The occupational value variables Interest and Satisfaction, and Salary were related to both GPA and job satisfaction. In addition, VDI was also found to be related to job satisfaction. Thus, the affective domain, of which these three variables are members, seems to be the most important in predicting job satisfaction. Perhaps schools should stress the affective domain more than they now do. The affective domain, generally given only superficial treatment by teachers, appears to play a more relevant role in the total development of the individual than was previously assumed, especially as it pertains to work satisfaction.

Usually an individual possesses enough ability to function at a given occupational level, but what seems to contribute to satisfaction or dissatisfaction is the degree of consistency within the person's value system.

General Conclusions

The findings of this study indicate that overall job satisfaction is not very predictable using in-school variables. In addition, the small amount of job satisfaction which was predictable by the model was predicted by variables associated with the affective domain, and not the cognitive or psychomotor domains. Overall, the degree of job satisfaction obtained by the three samples was that the males displayed the lowest amount, the total sample was next, and the females displayed the highest mean MSQ score. Although the females displayed the highest degree of satisfaction for the three samples, it was somewhat lower than the mean MSQ score for the normative group composed of both males and females. However, it appears that the sample utilized in this study closely resembled the MSQ normative group. Therefore, they were approximately as satisfied as, or perhaps slightly less satisfied than, the normative group.

In general, the findings of this study seem to imply that the educational system is neglecting an important area, the affective domain. Students need to be aware of and to develop their value system to some extent before entering into the work world. This conclusion supports the concept of Career Education, which stresses the development of the total individual in respect to future employment possibilities.

Next, provisions must be made in the educational system whereby changes in the career goals of students are possible upon receipt of new information. That is, the educational institution should function as a setting where change can take place with little or no harm to the individual. The system must retain the flexibility required to enable it to absorb such stresses. If these stresses are absorbed and dealt with in the security of the school setting, then the adult world should be approached with less apprehansion.

If the schools are to assume the role of change agents for society, then programs must be developed which will stress total, not just skill, development. Human resource development involves development of the total individual so that the individual becomes capable of contributing to and receiving benefits of society.

Education must provide the individual with skills from all three domains: the cognitive, psychomotor, and affective. The educational system provides the individual with the necessary skills from the first two domains, cognitive and psychomotor, with efficiency; but, it tends to do little with skills from the affective domain. However, these skills are important and need to be provided for the student. In order to accomplish this task, larger and more complete guidance programs, charged with the responsibility of supplying affective skills, should be initiated by school systems. The vocational curriculum does no better than the non-vocational curriculum in this respect.

The individual must be aware of himself and aware of his feeling toward the work world. Also, a retraining attitude must be developed by the individual, so that he/or she might be more able to interact with a rapidly changing industrial society. The student must also be taught

to be able to deal with retraining, new starts, and career shifts he may encounter. All of this could be provided with more emphasis on the affective domain. In this way, the high school program might become more complete and relevant to students.

Recommendations

In view of the findings and conclusions of this study, the following recommendations are suggested for further research and for education.

For Further Research

1. It is recommended that this study be replicated with another sample from a different community. In this way the validity of the model could be evaluated, and the reliability and generalizability of this study will be determined.
2. A separate investigation focusing on job satisfaction should be conducted using a revised model which includes additional variables from the affective domain and job satisfaction could be evaluated and the model extended.
3. Causal models based on longitudinal data related to the social sciences, particularly education, should be developed and evaluated using Path Analysis methodology.

For Education

4. Job satisfaction for females was predictable to some extent and satisfaction for males was not predictable using the model. That portion of satisfaction predictable for the females was

associated with variables from the affective domain. Since satisfaction for the males was not predictable, this finding seems to indicate that males need more attention in the development of components of the affective domain which relate to satisfaction. Educational administrators and curriculum planners must include experiences within the course of study which will permit all students to develop their affective characteristics.

5. It is evident from the findings of this study that overall job satisfaction is highly related to variables from the affective domain. These variables (occupational values Interest and Satisfaction and Salary, and Vocational Maturity) should receive the attention of high school curriculum planners and teachers as they develop course outlines and curriculum objectives. Affective domain development takes the form of clarification and identification of components of the domain rather than the transmission of knowledge and skills. Placing more emphasis on the affective domain should provide students the opportunity for a more realistic approach to the world of work.
6. The results of this study seem to indicate that the conceptual framework of Career Education is realistic and viable. That is, Career Education stresses the meaning of work and the relationship of the individual to the work environment. It provides individuals with the skills, knowledges and attitudes necessary to make work satisfying. This study draws attention to the relationship between the affective domain and work

satisfaction. Therefore, in addition to providing students with the necessary skills and knowledges associated with the world of work, Career Education also must continue to stress the importance of the affective domain. It must provide students with the opportunity to identify personal needs, interests and values. Once these factors are identified and understood, the individual should be better able to relate to the work environment.

7. Perhaps the overarching or global findings of this study is that female employment satisfaction was much more predictable than male employment satisfaction. The predictability of work satisfaction in the female sample may be attributed to the following:

    a. For the most part, entry level jobs are associated with lower levels of responsibility, low salaries and little or no immediate opportunities for advancement. The expressed satisfaction by females with jobs of this type may be attributed to the fact that most females tend to possess short range expectations of initial employment. This is described by occupational sociologists as the "until" phenomenon. The first job is usually transitional by nature and provides most females with a socially acceptable bridge between school and marriage. Those who do not marry eventually begin in their employment to seek job factors similar to those desired by their male peers.

b. In spite of the effort of the schools to provide all students with equal educational opportunities and to remove as much as possible sex biases in curricular offerings and instructional practice, it seems that the early experiences females have in both the home and school negate the attempt by the schools to provide equal cultural and educational experiences.

c. An analysis of the occupational areas which attract the majority of females indicates that women obtain employment in areas which are high in interpersonal social relationships. This implies that women may rank satisfaction received from the social environment above factors such as salary, responsibility and prestige. This greater emphasis on a rewarding social environment as one occupational preference for the typical female seemingly may compensate for factors which contribute toward job dissatisfaction in males.

d. Historically, females have not viewed employment with regard to long range security and promotional possibilities. This failure to view employment from this perspective suggests that females possess lower levels of occupational aspirations than do males. It seems then that their satisfaction with entry level occupations may be attributable to these generally lower levels of aspiration.

BIBLIOGRAPHY

Anderson, L. M. & Weiss, D. J. Stability of Measured Work Adjustment. Research Report, Work Adjustment Project, University of Minnesota, April 1971.

Banholzer, S. M. Job Satisfaction of the Female Blue Collar Worker. Unpublished Master of Arts Thesis, The Pennsylvania State University, 1970.

Blalock, H. M. Theory Building and Causal Inference. Methodology in Social Research. H. M. and A. B. Blalock (Eds.), New York: McGraw-Hill, 1968.

Blalock, H. M. Theory Construction From Verbal to Mathematical Formulations. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1969.

Blalock, H. M. (Ed.). Causal Models in the Social Sciences. New York: Aldine-Atherton, Inc., 1971.

Bloom, B. Speech at The Pennsylvania State University, July 1973.

Blare, P. & Duncan, O. The American Occupational Structure. New York: John Wiley and Sons, Inc., 1967.

Bonjean, C. M., Hill, R. J., & McLemore, S. D. Sociological Measurement: An Inventory of Scales and Indices. San Francisco: Chandler Publishing Company, 1968.

Borow, H. Man In A World At Work. Boston: Houghton Mifflin Co., 1964.

Brantner, S. T. & Enderlein, T. E. Identification of potential vocational high school dropouts. Journal of Industrial Teacher Education, 11, 1, Fall 1973, 44-52.

Brayfield, A. A. & Crockett, W. H. Employee attitudes and employee performance. Psychological Bulletin, 1955, 52, 396-424.

Breton, R. & McDonald, J. C. Career Decisions of Canadian Youth, A Compilation of Basic Data. Canadian Department of Manpower and Immigration, 1967.

Brenner, M. H. Use of high school data to predict work performance. Journal of Applied Psychology, 1968, 52, 1, 29-30.

Buehler, Charlotte. Der Meuschliche Lebenslauf als Psychologische Problem. Leipzig: Heizel, 1933.

Buros, O. K. Sixth Mental Measurements Yearbook. Highland Park, N. J.: The Gryphon Press, 1965.

Caplow, T. The Sociology of Work. Minneapolis: University of Minnesota Press, 1954.

Carlson, R. E., Davis, R. V. & Weiss, D. J. The effect of satisfaction on the relationship between abilities and satisfactoriness. Occupational Psychology, 1968, 43, 39-46.

Charner, I & Cohen, M. Instant Path Analysis Revisited: New Ingredients For an Old Recipe, Division G. Generator, 3, May 1973.

Coleman, J. S. & Others. Equality of Educational Opportunity. Washington, D. C.: U. S. Government Printing Office, 737, 1966.

Coppedge, F. L. Relation of selected variables from high school records to occupational and college success. The Journal of Educational Research, 1966, 63, 2, 71-73.

Cox, S. G. Do educational measures predict vocational success? Vocational Guidance Quarterly, June 1971, 19, 271-274.

Crider, D. M., Willits, F. K., & Bealer, R. C. Locating People in Longitudinal Studies, A Research Report and Suggested Guidelines. Bulletin 778, The Pennsylvania State University, College of Agriculture, Agricultural Experiment Station, University Park, Pennsylvania, 1972.

Crites, J. O. A model for the measurement of vocational maturity. Journal of Counseling Psychology, 1961, 8, 3, 255-259.

Crites, J. O. The measurement of vocational maturity in adolescence: I. The attitude test of the Vocational Development Inventory. Psychological Monographs, American Psychological Association, 1965.

Crites, J. O. Vocational Psychology. New York: McGraw-Hill, 1969a.

Crites, J. O. The Maturity of Vocational Attitudes in Adolescence. Iowa City: University of Iowa, 1969b.

Culhane, Margaret. The general aptitude test battery. Its availability and use. Vocational Guidance Quarterly, 1965, 14, 56-58.

Davis, R. V., England, G. W. & Lofquist, L. H. A theory of work adjustment. Minnesota Studies in Vocational Rehabilitation, 15, 1964.

Davis, R. V., Weiss, D. J., Lofquist, L. H. & Betz, E. Satisfaction as a moderator in the prediction of satisfactoriness. Proceedings, 75th Annual Convention of the American Psychological Association, 1967, 269-270.

Davis, R., Lofquist, L., & Weiss, D. A theory of work adjustment (a revision). Minnesota Studies in Vocational Rehabilitation, 23, Work Adjustment Project, Industrial Relations Center, University of Minnesota, Bulletin 47, 1968.

Davis, D. A., Hagan, N. & Strouf, J. Occupational choice of twelve-year-olds. The Personnel and Guidance Journal, March 1962, 40, 628-629.

Desmond, R. E. & Weiss, D. J. Measurement of Ability Requirements of Occupations. Work Adjustment Project, University of Minnesota, Research Report, No. 34, April 1970.

Dipboye, W. J. & Anderson, W. F. The ordering of occupational values by high school freshmen and seniors. The Personnel and Guidance Journal, October 1959, 38, 121-124.

Droege, R. C. Validity extension data on the General Aptitude Test Battery. Vocational Guidance Quarterly, 1965, 14, 56-58.

Droege, R. C. GATB longitudinal maturation study. American Personnel and Guidance Association Journal, May 1966, 919-930.

Dubois, P. H. An Introduction to Psychological Statistics. New York: Harper and Row, Inc., 1965.

Dunaway, W. F. History of the Pennsylvania State College. University Park: Pennsylvania State College, 1946. (quote)

Duncan, O. D. Socioeconomic Background and Occupational Achievement: Extensions of A Basic Model. Final Report, Ann Arbor: Michigan University, May 1968.

Duncan, O. D. Path Analysis: Sociological examples. Causal Models in the Social Sciences. H. M. Blalock (ed.), Chicago: Aldine-Atherton, Inc., 1971, 115-138.

Dvorak, B. J. The General Aptitude Test Battery. Personnel and Guidance Journal, 1965, 35, 145-155.

Enderlein, T. E. An Examination of the Relationship of Selected Student Variables to Vocational-Technical Shop Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 4, February 1972.

Enderlein, T. E. & Enderlein, Maxine, A. Relationship of selected student variables to vocational and technical laboratory achievement. Journal of Industrial Teacher Education, 1973, 10, 4, 46-53.

Eninger, M. V. The Process and Product of T and I High School Level Vocational Education in The United States, The Product. American Institute for Research in Behavioral Sciences, Pittsburgh, Pennsylvania, September 1965.

Eninger, M. V. Report on New York State Data From A National Follow-up Study of High School Level T and I Vocational Graduates. Educational Systems Research Institute, Pittsburgh, Pennsylvania, May 1967.

Ewen, R. B. Some determinants of job satisfaction: A study of the generality of Herzberg's Theory. Journal of Applied Psychology, 1964, 48, 161-163.

Featherman, D. L. Achievement orientations and socioeconomic career attainments. American Sociological Review, April 1972, 131-143.

Festinger, L. A Theory of Cognitive Dissonance. Stanford: Stanford University Press, 1957.

Flanagan, J. C., et.al. The American High School Student. Technical Report to the U. S. Office of Education, Cooperative Research Project No. 635. Pittsburgh: Project TALENT Office, University of Pittsburgh, 1964.

Flanagan, J. C. & Cooley, W. W. Project TALENT: One-Year Follow-up Studies. Pittsburgh: School of Education, University of Pittsburgh, 1966.

Garbin, A., Salomone, J., Jackson, D. and Bullweg, J. Worker Adjustment Problems of Youth in Transition From High School to Work. Research and Development Series No. 43, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, December 1970.

Gardner, B. B. & Moore, D. Human Relations in Industry. Chicago: Irwin, 1950.

Gay, E. G. & Weiss, D. J. Relationship of Work Experience and Measured Vocational Needs. Work Adjustment Project, University of Minnesota, Research Report No. 33, September 1970.

Ghiselli, E. E. The Validity of Occupational Aptitude Tests. New York: Wiley, 1966.

Ginzberg, E., Ginsburg, S. W., Axelrod, S., & Herma, J. L. Occupational Choice. New York: Columbia University Press, 1951.

Gray, B. L. & Weiss, D. S. A Pilot Study of the Measurement of Job Satisfaction of Mentally Retarded Adults. Proceedings, 79th Annual Convention of the American Psychological Association, 1971, 611-612.

Gribbons, W. D. & Lohnes, P. R. Emerging Careers. New York: Columbia Teachers College Press, 1968.

Hallberg, M. C. Statistical Analysis of Single Equation Stochastic Models Using the Digital Computer. University Park, Pennsylvania: The Pennsylvania State University, Department of Agricultural Economics and Rural Sociology, Monograph 78, February 1969 (revised February 1970).

Herzberg, F., Mausner, B., Peterson, R. & Capwell, D. Job Attitudes: Review of Research and Opinion. Pittsburgh: Psychological Service of Pittsburgh, 1957.

Herzberg, F., Mausner, B. & Snyderman, B. The Motivation to Work. New York: John Wiley and Sons, Inc., 1959.

Hollender, J. W. Development of vocational decisions during adolescence. Journal of Counseling Psychology, May 1971, 18, 3, 244-248.

Hollingshead, A. B. Elmstown's Youth: The Impact of Social Classes on Adolescents. New York: John Wiley and Sons, Inc., 1949.

Hollingshead, A. B. & Redlich, F. C. Social Class and Mental Illness. New York: John Wiley and Sons, Inc., 1958.

Howell, R. E. Factors Influencing the Occupational Attainment of Pennsylvania Young Males From Nonmetropolitan Areas. Unpublished doctoral dissertation, The Pennsylvania State University, 1970.

Hoyt, C. Test reliability obtained by analysis of variance. Psychometrika, 1941, 6, 153-160.

Hulen, C. L. & Smith, P. C. Sex differences in job satisfaction. Journal of Applied Psychology, April 1964, 48, 2, 88-92.

Impellitteri, J. T. & Kapes, J. T. Some evidence in using the GATB with vocational or technical bound ninth grade boys. Vocational Guidance Quarterly, 1969, 18, 59-64.

Impellitteri, J. T., Kapes, J. T., Siebert, N. W. & Wiersteiner, S. R. Factors Related to the Occupational Values and Vocational Maturity of a Selected Sample of Ninth Graders. Paper presented at the American Vocational Association, Boston, December 1969.

Impellitteri, J. T. & Kapes, J. T. The Measurement of Occupational Values. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, Vocational Development Study, Monograph Number 3, September 1971.

Ingerson, R. W. & Peters, H. J. Predictive indices of the GATB. The Personnel and Guidance Journal, May 1966, 931-943.

Jencks, C., Smith, M., Acland, H., Bane, Mary, Cohen, D., Gintis, H., Heyns, B. & Michelson, S. Inequality: A Reassessment of the Effect of Family and Schooling in America, New York: Basic Books, Inc., 1972.

Johnson, L. & Johnson, R. H. High school preparation, occupation and job satisfaction. The Vocational Guidance Quarterly, June 1972, 20, 4, 287-291.

Jury, P. A. & Others. The Relation of Sample Demographic Characteristics to Job Satisfaction. Minneapolis: Minnesota University, Industrial Relations Center, 1971.

Kapes, J. T. The Relationship Between Selected Characteristics of Ninth Grade Boys and Curriculum Selection and Success in Tenth Grade. University Park: The Pennsylvania State University, Research Report, Vocational Development Study, Series Monograph Number 2, August 1971.

Katy, D., Maccoby, N., Gurin, G., & Floor, L. G. Productivity, Supervision, and Morale Among Railroad Workers. Ann Arbor: University of Michigan, Survey Research Center, Institute for Social Research, 1951.

Katy, M. Decisions and Values: A Rationale for Secondary School Guidance. New York: College Entrance Board, 1963.

Kaufman, J. & Lewis, M. The Potential of Vocational Education: Observations and Conclusions. University Park: The Pennsylvania State University, The Institute for Research on Human Resources, May 1968.

Kerr, W. A., Koppelmeir, G. & Sullivan, J. J. Absenteeism, turnover, and morale in a metals fabrication factory. Occupation Psychology, 1951, 25, 50-55.

Kornhauser, A. W. & Sharp, A. A. Employee attitudes: Suggestions from a study in a factory. Personnel Journal, 1932, 10, 393-404.

Krouse, E. A. The Sociology of Occupations. Boston: Little, Brown and Company, 1971.

Land, K. C. Principles of path analysis. Sociological Methodology, E. F. Borgatta (Ed.), 1969, San Francisco: Jossey-Bass, Inc., Publishers, 1971.

Lester, R. Manpower Planning In A Free Society. New Jersey: Princeton University Press, 1966.

Lewis, E. C. & MacKinney. Counselor vs. statistical predictions of job satisfaction in engineering. Journal of Counseling Psychology, 1961, 8, 3, 224-229.

Li, J. Statistical Inference: I. Ann Arbor: Edwards Brothers, Inc., 1967.

Little, J. K. Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, 1970.

Lofquist, L. & Davis, R. with the assistance of Hendel, D. Application of the Theory of Work Adjustment to Rehabilitation and Counseling. Minnesota Studies in Vocational Rehabilitation: 30, Work Adjustment Project, Industrial Relations Center, University of Minnesota. Bulletin 58, June 1972.

Myers, M. Who are your motivated workers. Harvard Business Review, 1964, 42, 73-88.

Neff, W. S. Work and Human Behavior. New York: Atherton Press, 1968.

O'Reilly, P. A. Evaluation of In-School Success Criteria for Vocational-Technical Students. University Park: The Pennsylvania State University, Department of Vocational Education, Vocational Development Study, Monograph Number 6, May 1972.

O'Reilly, P. A. Predicting the Stability of Expressed Occupational Choices of Secondary Students. University Park: The Pennsylvania State University, Department of Vocational Education, Vocational Development Study, Monograph Number 13, May 1973.

Osipow, S. H. Theories of Career Development. New York: Appleton-Century-Crofts, 1968.

Paine, F., Deutsch, D. & Smith, R. Relationship between family backgrounds and work values. Journal of Applied Psychology, 1967, 51, 4, 320-323.

Parsons, F. Choosing A Vocation. Boston: Houghton Mifflin, 1909.

Picon, J. W. & Walker, J. P. The Role of Socioeconomic States and Significant Other Influence in Determining Educational Aspirations: A Black-White Comparison of Southern High School Seniors. Columbus: Ohio State University, April 1972.

Playfair, W. Wealth of Nations. Reprint by Adam Smith, from the eleventh London edition; with notes on supplementary chapters, and A Life of Dr. Smith, by William Playfair, Hartford: Printed for Oliver D. Cooke, Peter B. Gleason and Company, Printers, Vol. I, 1811.

Pucel, D. J., Nelson, H. F. & Wheeler, D. N. Differentiating Among Graduates of Vocational-Technical Curriculums. Minneapolis: University of Minnesota, Department of Industrial Education, Project MINI-SCORE, July 1970.

Pucel, D. S., Nelson, H. F. & Wheeler, D. N. Follow-up returns as a function of incentives and responder characteristics. Vocational Guidance Quarterly, March 1971, 19, 3, 188-192.

Rabinowitz, W. & Hans-Magne Eikeland. Estimating the reliability of tests with clustered items. Pedagogisk Forskning, 1964, 85-106.

Robinson, H. A. & Hoppock, R. Job satisfaction resume of 1951. Occupations, 1952, 30, 594-598.

Roe, A. The Psychology of Occupations. New York: John Wiley and Sons, Inc., 1956.

Rosenberg, M. Occupational Values and Occupational Choice. Unpublished doctoral dissertation, Columbia University, 1954.

Sagi, P. C., Olmstead, D. W. & Atelsek, F. Predicting maintenance of membership in small groups. Journal of Abnormal Social Psychology, 1955, 51, 308-311.

Schultz, T. W. Investment in human capital. The American Economic Review, 1961, 51, 1, 3.

Schwartz, M., Jenusaitis, E. & Stark, H. Motivational factors among supervisors in the utility industry. Personnel Psychology, 1963, 16, 45-53.

Super, D. E. A theory of vocational development. American Psychologist, 1953, 8, 185-190.

Super, D. E. The dimensions and measurement of vocational maturity. Teacher's College Record, 1955, 57, 151-163.

Super, D. E. The use of multifactor test batteries in guidance. Personnel and Guidance Journal, 1956, 36, 17-20.

Super, D. E., Crites, J. O., Hummel, R. D., Moser, H. P., Overstreet, P. L., & Warnath, C. F. Vocational Development: A Framework for Research. New York: Columbia University, Teacher's College, Bureau of Publications, 1957.

Super, D. E. The Psychology of Careers. New York: Harper, 1957.

Super, D. E. The multifactor tests: Summing up. Personnel and Guidance Journal, 1957, 36, 145-155.

Super, D. E. & Overstreet, Phoebe L., with Morris, C. N., Dubin, W. & Heyde, M. B. The Vocational Maturity of Ninth Grade Boys. New York: Columbia University, Teacher's College, Bureau of Publications, 1960.

Super, D. E. & Crites, J. O. Appraising Vocational Fitness, 2nd Ed. New York: Harper and Row, 1962.

Super, D. E. Work Values Inventory. New York: Houghton Mifflin Co., 1964.

Super, D. E. Vocational development theory in 1988. The Counseling Psychologist, 1969, 1, 9-14.

Taylor, K. W. & Weiss, D. J. Prediction of Individual Job Turnover From Measured Job Satisfaction. Proceedings, 77th Annual Convention of The American Psychological Association, 1969, 587-588.

Thompson, D. E. Occupational values of high school students. The Personnel and Guidance Journal, April 1966, 40, 15-20.

Travers, R. M. W. Essentials of Learning, An Overview for Students of Education. 2nd Ed. New York: Macmillan Company, 1967.

United States Congress. Public Law 347, Sixty-fourth Congress. Smith-Hughes Act, 1917.

United States Congress. Public Law 586, Seventy-ninth Congress. George-Barden Act, 1946.

United States Congress. Public Law 85-864, Eighty-fifth Congress. National Defense Education Act, 1958.

United States Congress. Public Law 89-15, Eighty-ninth Congress. Manpower Development and Training Act of 1962.

United States Congress. Public Law 88-210, Eighty-eighth Congress. Vocational Education Act of 1963.

United States Congress. Public Law 90-576, Ninetieth Congress, Vocational Education Amendment of 1968.

United States Department of Health, Education, and Welfare. Report of a special task force to the secretary of the Department of Health, Education, and Welfare, Work in America, Forward by Elliot L. Richardson: Cambridge: The MIT Press, 1972.

United States Department of Labor. Dictionary of Occupational Titles: Volume II, 3rd Edition. U. S. Government Printing Office, 1965.

United States Department of Labor. Manual for the General Aptitude Test Battery. Section III: Development. Washington, D. C.: The United States Government Printing Office, 1967.

United States Department of Labor. Manpower Report of the President Including A Report on Manpower Requirements, Resources, Utilization and Training. Washington, D. C.: U. S. Government Printing Office, 1971.

United States Government Printing Office. United States Statutes at Large, 36th - 37th Congress, 1859-63. Washington, D. C.: U. S. Government Printing Office, Vol. 12, 1864.

Venn, G. Man, Education, and Work. Washington, D. C.: American Council on Education, 1964.

Vessey, T. M. & Handel, D. D. Effects of Lowered Reading Level and Anchors on Responses to the Minnesota Job Requirements Questionnaire. Work Adjustment Project, University of Minnesota, Research Report No. 38, October 1970.

Vroom, V. H. Work and Motivation. New York: John Wiley and Sons, 1964.

Weiss, D. J., Davis, R. V., Lofquist, L. H. & England, G. W. Instrumentation For The Theory of Work Adjustment. Minnesota Studies in Vocational Rehabilitation: 21 Industrial Relations Center, University of Minnesota, 1966.

Weiss, D., Davis, R., England, G. & Lofquist, L. Manual for the Minnesota Satisfaction Questionnaire. Minnesota Studies in Vocational Rehabilitation: 23, Work Adjustment Project, Industrial Relations Center, University of Minnesota, Bulletin 47, 1967.

Weitz, J. & Nuckols, R. E. The validity of direct and indirect questions in measuring job satisfaction. Personnel Psychology, 1953, 6, 487-494.

Wernimont, P. Intrinsic and extrinsic factors in job satisfaction. Journal of Applied Psychology, February 1966, 50, 5, 41-50.

Shyte, W. F. Men at Work. Illinois: The Dorsey Press, 1961.

Wright, S. Correlation and causation. Journal of Agricultural Research. 1921, 20, 557-585.

Zytowski, D. G. Vocational Behavior: Readings in Theory and Research. New York: Holt, Rinehart and Winston, Inc., 1968.

Zytowski, D. G. The concept of work values. Vocational Guidance Quarterly, 1970, 18, 176-186.

APPENDIX A

SAMPLE QUESTIONNAIRE

PART A—PLEASE USE NO. 2 PENCIL

COPYRIGHT 1973
THE PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF VOCATIONAL EDUCATION
UNIVERSITY PARK, PA.
ALL RIGHTS RESERVED

DO NOT WRITE IN THIS SPACE

1. NAME _____ _____ _____ _____ SOCIAL SECURITY NUMBER _____ _____ _____
LAST FIRST M.I. MAIDEN (IF APPLICABLE)

CURRENT MAILING ADDRESS (if different from address on envelope of this letter).
STREET CITY STATE ZIP

2. DO YOU LIVE WITH A PARENT OR GUARDIAN?
- YES
- NO

3. MARITAL STATUS:
- SINGLE
- MARRIED
- DIVORCED

4. GRADES ATTENDED IN THE SCHOOL SYSTEM WHERE YOU ATTENDED HIGH SCHOOL.
- ALL 12 GRADES
- ONLY HIGH SCHOOL
- HIGH SCHOOL PLUS SOME GRADE SCHOOL

5. INDICATE YOUR HIGH SCHOOL GRADUATION STATUS:
- GRADUATED IN JUNE
- GRADUATED SINCE JUNE
- RECEIVED HIGH SCHOOL EQUIVALENCY DIPLOMA
- HAVE NOT YET RECEIVED A HIGH SCHOOL DIPLOMA

6. PLEASE MARK YOUR PRESENT OCCUPATIONAL STATUS. DO NOT MARK MORE THAN ONE BOX.
- EMPLOYED FULL TIME
- EMPLOYED PART TIME
- UNEMPLOYED, LOOKING FOR WORK
- UNEMPLOYED, NOT LOOKING FOR WORK
- MILITARY
- HOUSEWIFE
- OTHER, EXPLAIN: _____

7. PLEASE MARK YOUR PRESENT EDUCATIONAL STATUS. DO NOT MARK MORE THAN ONE BOX.
- SCHOOL OR COLLEGE, FULL TIME
- SCHOOL OR COLLEGE, PART TIME
- NOT GOING TO ANY SCHOOL OR COLLEGE
- OTHER, EXPLAIN _____

8. WHAT VOCATION OR PROFESSION WOULD YOU LIKE MOST TO FOLLOW?

9. WHAT VOCATION OR PROFESSION ARE YOU MOST LIKELY TO FOLLOW?

10. I WOULD DESCRIBE MYSELF AS:
- LIBERAL
- CONSERVATIVE
- MODERATE OR MIDDLE OF THE ROAD
- NOT INTERESTED IN POLITICS

11. DID YOU VOTE IN THE LAST ELECTION?
- YES
- NO
- WAS UNDER 18

DC 30-615

INDICATE HOW YOU FEEL ABOUT THE FOLLOWING STATEMENTS IN REGARD TO THE INSTITUTIONS MENTIONED.
RESPOND IN THE FOLLOWING MANNER:
1=STRONGLY DISAGREE 2=DISAGREE 3=NEUTRAL 4=AGREE 5=STRONGLY AGREE

	I AM PROUD OF MY HIGH SCHOOL.	IT IS IMPORTANT FOR MY HIGH SCHOOL TO HAVE A WINNING FOOTBALL TEAM.	I AM PROUD OF MY HOMETOWN	MY HIGH SCHOOL TEACHERS HAVE DONE A GOOD JOB	MY HIGH SCHOOL GUIDANCE PROGRAM HAS DONE A GOOD JOB
	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)

INDICATE HOW YOU FEEL ABOUT THE FOLLOWING STATEMENTS IN TERMS OF YOUR POLITICAL VIEWS. RESPOND IN THE SAME MANNER AS ABOVE.

	KEEPING INFORMED OF CURRENT EVENTS IS IMPORTANT FOR RESPONSIBLE VOTING.	VOTING IS A RESPONSIBILITY.	PEOPLE IN GOVERNMENT ARE BASICALLY HONEST.	I AM PROUD TO BE AN AMERICAN.	COURTS ARE TOO SOFT ON THOSE WHO BREAK THE LAW	CITIZENS SHOULD BE ACTIVE IN LOCAL POLITICS.	LABOR UNIONS ARE IMPORTANT TO THE WORKING MAN.
	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)

INDICATE HOW IMPORTANT IS EACH OF THE FOLLOWING REGARDING YOU WORKING AT A FUTURE JOB.
1=UNIMPORTANT 2=SOMEWHAT IMPORTANT 3=MODERATELY IMPORTANT 4=VERY IMPORTANT 5=EXTREMELY IMPORTANT

	THE WORK IS STIMULATING TO ME.	THE JOB CAN LEAD TO BETTER JOBS.	THE WAGES PAID ARE GOOD.	THE WORK BRINGS WITH IT A LOT OF PRESTIGE.	THE JOB FITS INTO MY PLAN OF LIFE.	IT'S AN OPPORTUNITY TO USE MY TRAINING AND BACKGROUND.	I CAN BE SURE OF A JOB EVEN IN HARD TIMES.	I CAN HELP OTHER PEOPLE THROUGH THE JOB.	I LIKE MY CO-WORKERS ON THE JOB.	I HAVE FREEDOM AND INDEPENDENCE ON THE JOB.
	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)	(1) (2) (3) (4) (5)

PERSONALITY GOING TO SCHOOL. COMPLETE ONLY PART B AND DISREGARD PARTS C AND D.
IF YOU ARE CURRENTLY EMPLOYED, COMPLETE PART C AND DISREGARD PARTS B & D.
IF YOU ARE CURRENTLY EMPLOYED AND GOING TO SCHOOL, COMPLETE PART D AND DISREGARD PARTS B & C.
IF YOU ARE NEITHER EMPLOYED NOR GOING TO SCHOOL, COMPLETE PART B OR C, WHICHEVER YOU FEEL APPLIES.

PART B—PLEASE USE NO. 2 PENCIL

1. NAME OF SCHOOL

ADDRESS OF SCHOOL

MAJOR COURSE OF STUDY

2. WHAT TIME OF YEAR DID YOU BEGIN YOUR POST HIGH SCHOOL EDUCATION?
- SUMMER
- FALL
- WINTER
- SPRING

3. DO YOU ATTEND HIS SCHOOL ON PENNSYLVANIA?
- YES
- NO

4. APART FROM YOURSELF, WHO INFLUENCED AND ASSISTED YOU MOST IN CHOOSING YOUR PRESENT EDUCATIONAL PROGRAM?
- PARENTS
- FRIEND OR OTHER RELATIVE
- GUIDANCE COUNSELOR
- OTHER SCHOOL PERSONNEL
- SOMEONE OTHER THAN ABOVE

5. TYPE OF SCHOOL YOU ATTEND:
- UNIVERSITY (4 YEARS)
- STATE COLLEGE
- LIBERAL ARTS COLLEGE
- TWO YEAR COLLEGE—TRANSFER
- TWO YEAR COLLEGE—NON DEGREE
- BUSINESS SCHOOL OR COLLEGE
- TRADE SCHOOL
- HOSPITAL SCHOOL OF NURSING
- OTHER, SPECIFY _____

6. DISTANCE IN MILES BETWEEN YOUR PRESENT HIGH SCHOOL AND THE SCHOOL YOU ATTEND:

7. PLEASE CHECK THE TYPES OF SCHOLARSHIPS YOU ARE RECEIVING:
- PHEAA (STATE) SCHOLARSHIP
- PHEAA (STATE) LOAN
- OTHER SCHOLARSHIP
- OTHER LOAN
- PART TIME JOB
- ASSISTANCE FROM PARENTS
- NONE
- OTHER _____

DO NOT WRITE IN THIS SPACE

8. HOW DO YOU VIEW THE PROBABILITY THAT YOU WILL SUCCESSFULLY COMPLETE YOUR CURRENT EDUCATIONAL PROGRAM?
- 5 EXCELLENT
- 4 GOOD
- 3 FAIR
- 2 POOR
- 1 I HAVE ALREADY WITHDRAWN

9. WHAT IS YOUR CURRENT GPA (USING THE 4 POINT SYSTEM)

10. HOW SATISFIED ARE YOU WITH THE FOLLOWING:

	DID NOT TAKE	NO VALUE	LITTLE VALUE	NEUTRAL	VALUABLE	VERY VALUABLE
ENGLISH						
MATHEMATICS						
SCIENCE						
SOCIAL SCIENCE						
HISTORY						
COMMERCIAL OR BUSINESS COURSES						
VOCATIONAL COURSES (SPECIFY) _____						
HOME ECONOMICS						
INDUSTRIAL ARTS						
OTHER (SPECIFY) _____						

	VERY DISSATISFACTORY	DISSATISFACTORY	NEUTRAL	SATISFACTORY	VERY SATISFACTORY
YOUR TOTAL HIGH SCHOOL EDUCATION?					
THE PREPARATION YOUR HIGH SCHOOL EXPERIENCE HAS PROVIDED FOR YOUR POST SECONDARY EDUCATION?					
YOUR CHOICE OF POST HIGH SCHOOL INSTITUTION?					
YOUR CHOICE OF EDUCATIONAL PROGRAM?					
THE LEVEL OF SUCCESS YOU HAVE EXPERIENCED THUS FAR IN YOUR EDUCATIONAL PROGRAM?					
THE OVERALL QUALITY OF THE PROGRAM IN WHICH YOU ARE ENROLLED?					
THE SERVICES YOUR HIGH SCHOOL GUIDANCE COUNSELOR PROVIDED IN HELPING YOU SELECT AND GAIN ADMITTANCE TO A SCHOOL OR COLLEGE?					

DC 30-604

PART C—PLEASE USE NO. 2 PENCIL.

COPYRIGHT 1973
THE PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF VOCATIONAL EDUCATION
ALL RIGHTS RESERVED

DO NOT WRITE IN THIS SPACE

1.

WHAT IS YOUR PRESENT JOB TITLE?

2. HOW MANY JOBS HAVE YOU HAD SINCE HIGH SCHOOL?
- ONE
- TWO
- THREE
- MORE THAN 3

3. DO YOU WORK IN PENNSYLVANIA?
- YES
- NO

4. ARE/E FROM YOURSELF, WHO ASSISTED YOU MOST IN SECURING YOUR PRESENT JOB?
- PARENTS
- FRIEND OR OTHER RELATIVE
- STATE EMPLOYMENT OFFICE PERSONNEL
- GUIDANCE COUNSELOR
- VOCATIONAL SCHOOL PERSONNEL
- SOMEONE OTHER THAN ABOVE

NAME OF EMPLOYER	STREET	CITY / STATE / ZIP ADDRESS OF EMPLOYER			
5. LENGTH OF TIME IN YEARS BETWEEN HIGH SCHOOL GRADUATION AND YOUR FIRST JOB	6. NUMBER OF WEEKS YOU WORKED AT FIRST JOB	7. WHAT WAS YOUR APPROXIMATE BEGINNING WEEKLY SALARY FOR FIRST JOB? (Before taxes and other deductions)	8. DISTANCE IN MILES BETWEEN YOUR HIGH SCHOOL AND PRESENT JOB?	9. WHAT APPROXIMATELY IS YOUR PRESENT WEEKLY SALARY? (Before taxes and other deductions)	
00 01 02 03 04 05 06 07 08 09 10	00 01 02 03 04 05 06 07 08 09 10	$00 $01 $02 $03 $04 $05 $06 $07 $08 $09 $10	00 01 02 03 04 05 06 07 08 09 10	$0 $1 $2 $3 $4 $5 $6 $7 $8 $9 $10	00 01 02 03 04 05 06 07 08 09 10
11 12 13 14 15 16 17 18 19 20 21	11 12 13 14 15 16 17 18 19 20 21	$11 $12 $13 $14 $15 $16 $17 $18 $19 $20 $21	11 12 13 14 15 16 17 18 19 20 21	$11 $12 $13 $14 $15 $16 $17 $18 $19 $20 $21	11 12 13 14 15 16 17 18 19 20 21
22 23 24 25 26 27 28 29 30 31 32	22 23 24 25 26 27 28 29 30 31 32	$22 $23 $24 $25 $26 $27 $28 $29 $30 $31 $32	22 23 24 25 26 27 28 29 30 31 32	$22 $23 $24 $25 $26 $27 $28 $29 $30 $31 $32	22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43	33 34 35 36 37 38 39 40 41 42 43	$33 $34 $35 $36 $37 $38 $39 $40 $41 $42 $43	33 34 35 36 37 38 39 40 41 42 43	$33 $34 $35 $36 $37 $38 $39 $40 $41 $42 $43	33 34 35 36 37 38 39 40 41 42 43
44 45 46 47 48 49 50 51 52 53 54	44 45 46 47 48 49 50 51 52 53 54	$44 $45 $46 $47 $48 $49 $50 $51 $52 $53 $54	44 45 46 47 48 49 50 51 52 53 54	$44 $45 $46 $47 $48 $49 $50 $51 $52 $53 $54	44 45 46 47 48 49 50 51 52 53 54
55 56 57 58 59 60 61 62 63 64 65	55 56 57 58 59 60 61 62 63 64 65	$55 $56 $57 $58 $59 $60 $61 $62 $63 $64 $65	55 56 57 58 59 60 61 62 63 64 65	$55 $56 $57 $58 $59 $60 $61 $62 $63 $64 $65	55 56 57 58 59 60 61 62 63 64 65
66 67 68 69 70 71 72 73 74 75 76	66 67 68 69 70 71 72 73 74 75 76	$66 $67 $68 $69 $70 $71 $72 $73 $74 $75 $76	66 67 68 69 70 71 72 73 74 75 76	$66 $67 $68 $69 $70 $71 $72 $73 $74 $75 $76	66 67 68 69 70 71 72 73 74 75 76
77 78 79 80 81 82 83 84 85 86 87	77 78 79 80 81 82 83 84 85 86 87	$77 $78 $79 $80 $81 $82 $83 $84 $85 $86 $87	77 78 79 80 81 82 83 84 85 86 87	$77 $78 $79 $80 $81 $82 $83 $84 $85 $86 $87	77 78 79 80 81 82 83 84 85 86 87
88 89 90 91 92 93	88 89 90 91 92 93	$88 $89 $90 $91 $92 $93	88 89 90 91 92 93	$88 $89 $90 $91 $92 $93	88 89 90 91 92 93

CONTINUE PART C ON OTHER SIDE

| | | |

VOCATIONAL DEVELOPMENT STUDY SERIES

Impellitteri, Joseph T. and Kapes, Jerome T. A Longitudinal Study of Vocational Development: Implications for Vocational Education and Guidance. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 1, July, 1971.

Kapes, Jerome T. The Relationship Between Selected Characteristics of Ninth Grade Boys and Curriculum Selection and Success in Tenth Grade. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 2, August, 1971.

Impellitteri, Joseph T. and Kapes, Jerome T. The Measurement of Occupational Values. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 3, September, 1971.

Enderlein, Thomas E. An Examination of the Relationship of Selected Student Variables to Vocational-Technical Shop Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 4, February, 1972.

Kapes, Jerome T. and Lotowycz, Leo W. Changes in the Occupational Values of Students Between Ninth and Tenth Grade as Related to Course of Study and Other Student Characteristics. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 5, April, 1972.

O'Reilly, Patrick A. Evaluation of In-School Success Criteria for Vocational-Technical Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 6, May, 1972.

Brantner, Seymour T. and Enderlein, Thomas E. A Comparison of Vocational and Non-Vocational High School Dropouts and Retainers. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 7, June, 1972.

Martin, Randall B. Relationships Between Holland's Vocational Preference Inventory and Vocational-Technical Student Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 8, October, 1972.

McAlister, Bernard M. Curriculum Selection and Success of Tenth Grade Girls as Related to Selected Ninth Grade Characteristics. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 9, March, 1973.

Hill, Theodore A., Kapes, Jerome T., Martin, Randall B. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Altoona Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 10, April, 1973.

VOCATIONAL DEVELOPMENT STUDY SERIES (Cont'd)

Kapes, Jerome T., Hill, Theodore A., Martin, Randall B. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Hazleton Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 11, April, 1973.

Martin, Randall B., Hill, Theodore A., Kapes, Jerome T. The Ninth Grade Characteristics of Students Entering Different Tenth Grade Curricula: VDS Williamsport Sample. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 12, April, 1973.

O'Reilly, Patrick A. Predicting the Stability of Expressed Occupational Choices of Secondary Students. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 13, May, 1973.

Strickler, Robert E. Change in Selected Characteristics of Students Between Ninth and Twelfth Grade as Related to High School Curriculum. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 14, June, 1973.

Brown, Richard H., Kapes, Jerome T. A Longitudinal Study of the Level of Occupational Aspirations of Youth Over the High School Years. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 15, October, 1973.

Schowalter, Lynn M. The Relationship of High School Curriculum and Other In-School Characteristics to Employment Success One Year After Graduation. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 16, March, 1974.

Kapes, Jerome T., Pawlowski, Vladimir. Characteristics of Vocational-Technical Instructors and Their Relationship to Student Shop Achievement. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 17, April, 1974.

McQuay, Paul L. Shop Achievement as an Outcome of One Year Versus Two Years of AVTS Instruction. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 18, May, 1974.

Kapes, Jerome T., Rollins, Robert D. The Ninth Grade Characteristics of Students Enrolled in Selected AVTS Programs in Twelfth Grade. University Park, Pennsylvania: Department of Vocational Education, The Pennsylvania State University, VDS Monograph Number 19, June, 1974.